PHILIPS 25PT4673

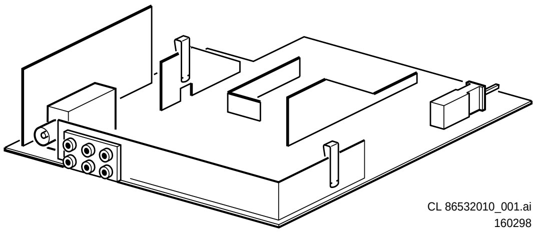
MODEL

SERVICE MANUAL

Colour Television **Chassis**

L7.3A
AA

Service
Service
Service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Service Manual

Content

1	Technical specifications		2	
2	Connection facilities, location of panels		3	
3	Safety instructions, Warnings and Notes		4	
4	Mechanical instructions		6	
5	Repair facilities		7	
	Software adjustments and Hotel mode		12	
6	Block diagram,		13	
	Survey of testpoints		14	
	Diagram supply voltages survey			
7	Electrical Diagrams and print lay-outs			
			Diagram	*PWB*
	Main PWB layout			16
	Power supply	diagram A1	17	16
	Main PWB layout			18
	Line drive	diagram A2	19	18
	Sync-frame & vertical drive	diagram A3	20	18
	Video Processing	diagram A4	21	18
	Control	diagram A5	22	18
	Sound processing	diagram A6	23	18
	Sound amplifier	diagram A7	24	18
	BTSC decoding	diagram A8	25	18
	CRT PWB/ Audio sound PWB			26
	CRT module	diagram B	27	26
	Nicam sound panel	diagram C	28	26
8	Electrical adjustments		29	
9	Circuit Descriptions new circuits		31	
10	Directions for use (limited)		38	
11	List of abbreviations		46	
12	Spareparts list		47	

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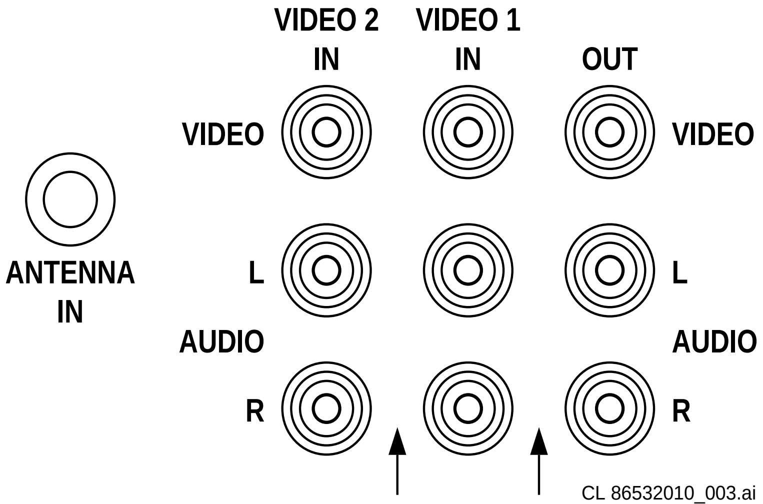
Published by LV 9864 TV Service Department Printed in The Netherlands Subject to modification (GB) 4822 727 21566

PHILIPS

1 Technical specifications

Mains Voltage:	: 150 - 276 Volt
	: 90 - 276 Volt
Mains frequency	: 50 Hz
	: 60 Hz
Power Consumption in stand-by	: < 10 Watt
Power Consumption normal mode	: 25” : 75Watt +/- 10%
	: 29” : 90 Watt +/- 10%
Chassis mains isolated	: Yes
Aerial input impedance TV	: 75 Ohm - coax
Picture tube range	: 25” and 29”
EHT voltage for 25”	: 27 KVolt
EHT voltage for 29”	: 30 KVolt
Max EHT power	: Linitted at 33 Watt
Sound output power	: 2 X 3 Watt
	: 2 X 5 Watt
Picture S/N at 70uVolts	: > 46 dB unweighted
	: > 53 dB weigted

2 Connection facilities


VIDEO 2
IN
VIDEO 1
IN
OUT
VIDEO
VIDEO
ANTENNA
IN
L
L
AUDIO
AUDIO
R
R

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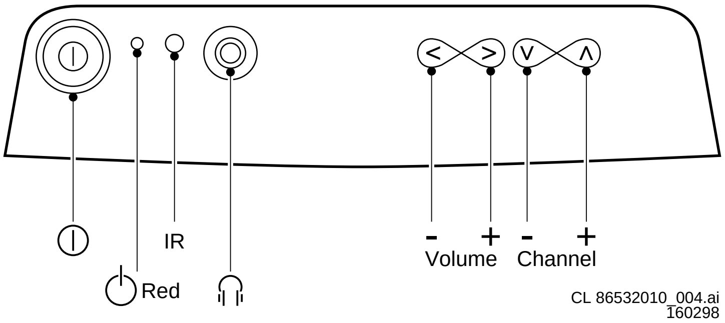
IR
Red
-
+
-
+
Volume
Channel

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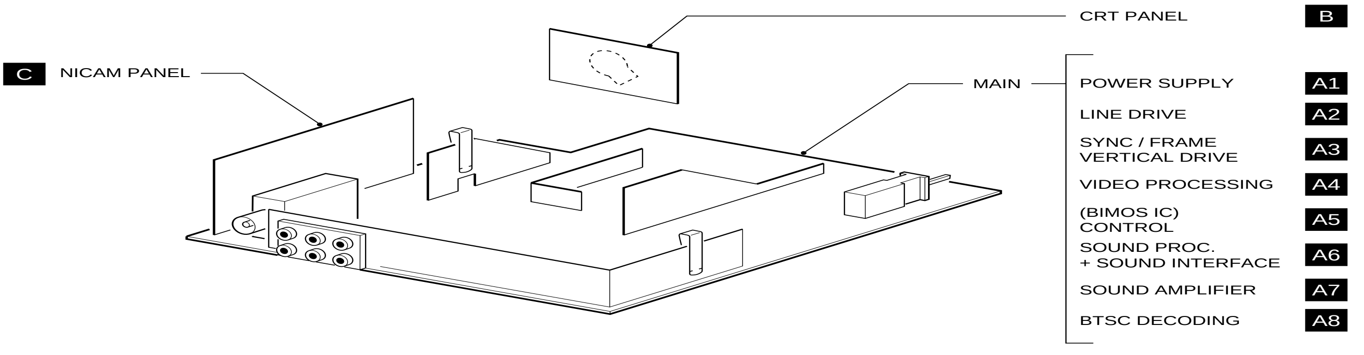
2.1 Cinch

- Video 1Vpp/75Ω ◎
- Audio L(0.5Vrms ≥10kΩ) ◎
- Audio R(0.5Vrms ≥10kΩ) ◎

2.2 Head phone

- (8 - 600Ω / 4mW) 3.5mm

2.3 Location of panels


CRT PANEL
B
C
NICAM PANEL
MAIN
POWER SUPPLY
A1
LINE DRIVE
A2
SYNC / FRAME
VERTICAL DRIVE
A3
VIDEO PROCESSING
A4
(BIMOS IC)
CONTROL
A5
SOUND PROC.
+ SOUND INTERFACE
A6
SOUND AMPLIFIER
A7
BTSC DECODING
A8

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3 Safety instructions, Maintenance instruction,

3.1 Safety instructions for repairs

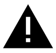

Figure 3-1

1. Safety regulations require that during a repair:
   - the set should be connected to the mains via an isolating transformer;
   - safety components, indicated by the symbol (see fig. 3.1), should be replaced by components identical to the original ones;
   - when replacing the CRT, safety goggles must be worn.

2. Safety regulations require that after a repair the set must be returned in its original condition. In particular attention should be paid to the following points.
   - As a strict precaution, we advise you to resolder the solder joints through which the horizontal deflection current is flowing, in particular:
     - all pins of the line output transformer (LOT);
     - fly-back capacitor(s);
     - S-correction capacitor(s);
     - line output transistor;
     - pins of the connector with wires to the deflection coil;
     - other components through which the deflection current flows.

     Note: This resoldering is advised to prevent bad connections due to metal fatigue in solder joints and is therefore only necessary for television sets older than 2 years. The wire trees and EHT cable should be routed correctly and fixed with the mounted cable clamps.

   - The insulation of the mains lead should be checked for external damage.
   - The mains lead strain relief should be checked for its function in order to avoid touching the CRT, hot components or heat sinks.
   - The electrical DC resistance between the mains plug and the secondary side should be checked (only for sets which have a mains isolated power supply). This check can be done as follows:
     - unplug the mains cord and connect a wire between the two pins of the mains plug;
     - set the mains switch to the on position (keep the mains cord unplugged!);
     - measure the resistance value between the pins of the mains plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MW and 12 MW;
     - switch off the TV and remove the wire between the two pins of the mains plug.

   - The cabinet should be checked for defects to avoid touching of any inner parts by the customer.

3.2 Maintenance instruction

It is recommended to have a maintenance inspection carried out by a qualified service employee. The interval depends on the usage conditions:

- When the set is used under normal circumstances, for example in a living room, the recommended interval is 3 to 5 years.
- When the set is used in circumstances with higher dust, grease or moisture levels, for example in a kitchen, the recommended interval is 1 year.
- The maintenance inspection contains the following actions:
  - Execute the above mentioned 'general repair instruction'.
  - Clean the power supply and deflection circuitry on the chassis.
  - Clean the picture tube panel and the neck of the picture tube.

3.3 Warnings

1. ESD
   All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
   - Available ESD protection equipment:
   - anti-static table mat (large 1200x650x1.25mm) 4822 466 10953
   - anti-static table mat (small 600x650x1.25mm) 4822 466 10958
   - anti-static wristband 4822 395 10223
   - connection box (3 press stud connections, 1 M ohm) 4822 320 11307
   - extension cable (2 m, 2 M ohm; to connect wristband to connection box) 4822 320 11305
   - connecting cable (3 m, 2 M ohm; to connect table mat to connection box) 4822 320 11306
   - earth cable (1 M ohm; to connect any product to mat or connection box) 4822 320 11308
   - complete kit ESD3 (combining all 6 prior products - small table mat) 4822 310 10671
   - wristband tester 4822 344 13999

2. In order to prevent damage to ICs and transistors, all high-voltage flashovers must be avoided. In order to prevent damage to the picture tube, the method shown in Fig. 3.2 should be used to discharge the picture tube. Use a high-voltage probe and a multimeter (position DC-V). Discharge until the meter reading is 0V (after approx. 30s).
3. Together with the deflection unit and any multipole unit, the flat square picture tubes used from an integrated unit. The deflection and the multipole units are set optimally at the factory. Adjustment of this unit during repair is therefore not recommended.
4. Be careful during measurements in the high-voltage section and on the picture tube.
5. Never replace modules or other components while the unit is switched on.
6. When making settings, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.
7. Wear safety goggles during replacement of the picture tube

3.4 Notes

1. The direct voltages and oscillograms should be measured with regard to the tuner earth , or hot earth as this is called (see fig. 3.3)
2. The direct voltages and oscillograms shown in the diagrams are indicative and should be measured in the Service Default Mode (see chapter 8) with a colour bar signal and stereo sound (L:3 kHz, R:1 kHz unless stated otherwise) and picture carrier at 475.25 MHz.

3. Where necessary, the oscillograms and direct voltages are measured with and without aerial signal. Voltages in the power supply section are measured both for normal operation and in standby . These values are indicated by means of the appropriate symbols (see fig. 3.3).
4. The picture tube PWB has printed spark gaps. Each spark gap is connected between an electrode of the picture tube and the Aquadag coating.
5. The semiconductors indicated in the circuit diagram and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

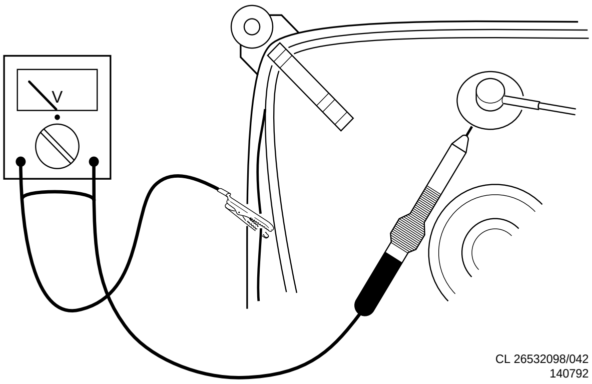

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Figure 3-2

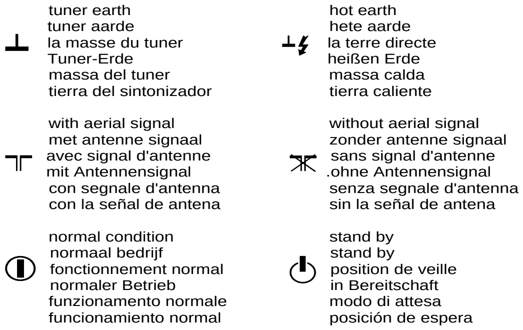
tuner earth
tuner aarde
la masse du tuner
Tuner-Erde
massa del tuner
tierra del sintonizador
hot earth
hete aarde
la terre directe
heißen Erde
massa calda
tierra caliente
with aerial signal
met antenne signaal
avec signal d'antenne
mit Antennensignal
con segnale d'antenna
con la señal de antena
without aerial signal
zonder antenne signaal
sans signal d'antenne
.ohne Antennensignal
senza segnale d'antenna
sin la señal de antena
normal condition
normaal bedrijf
fonctionnement normal
normaler Betrieb
funzionamento normale
funcionamiento normal
stand by
stand by
position de veille
in Bereitschaft
modo di attesa
posición de espera

Figure 3-3

4 Mechanical instructions

For the service position of the main carrier see figure 4.1: The main carrier can be removed by releasing the 2 carrier blocking lips (1) and pulling the carrier panel backwards.

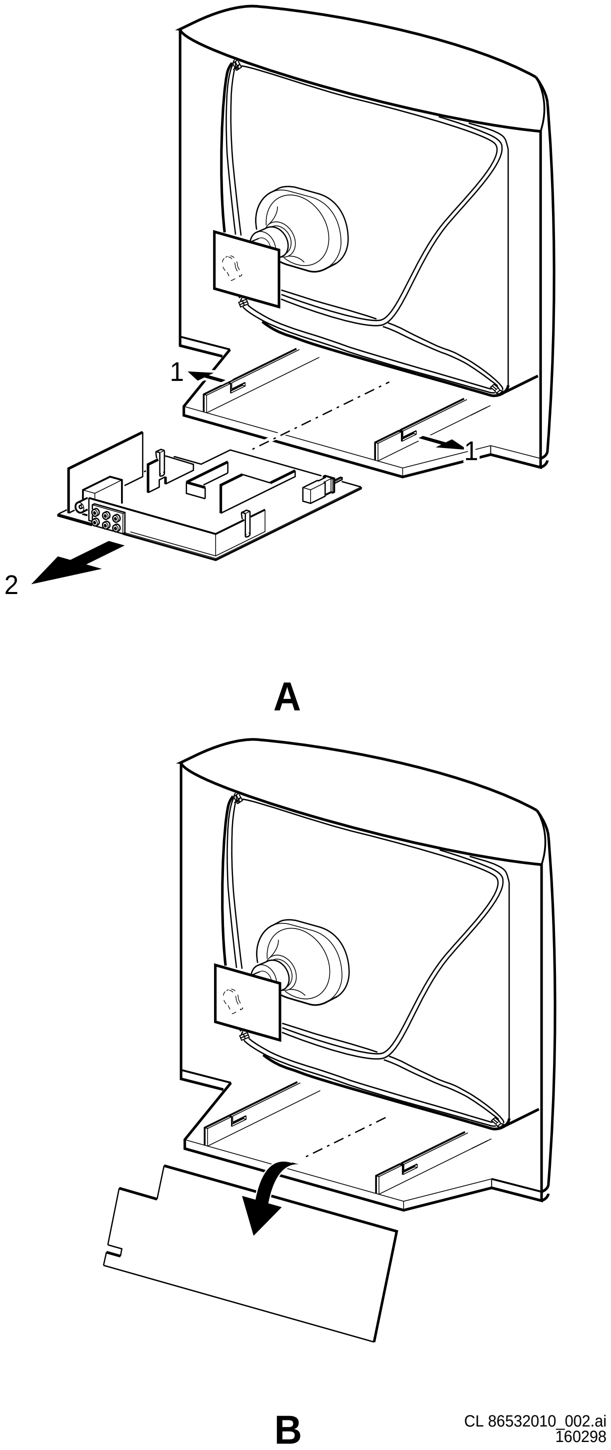
1
1
2
A
B
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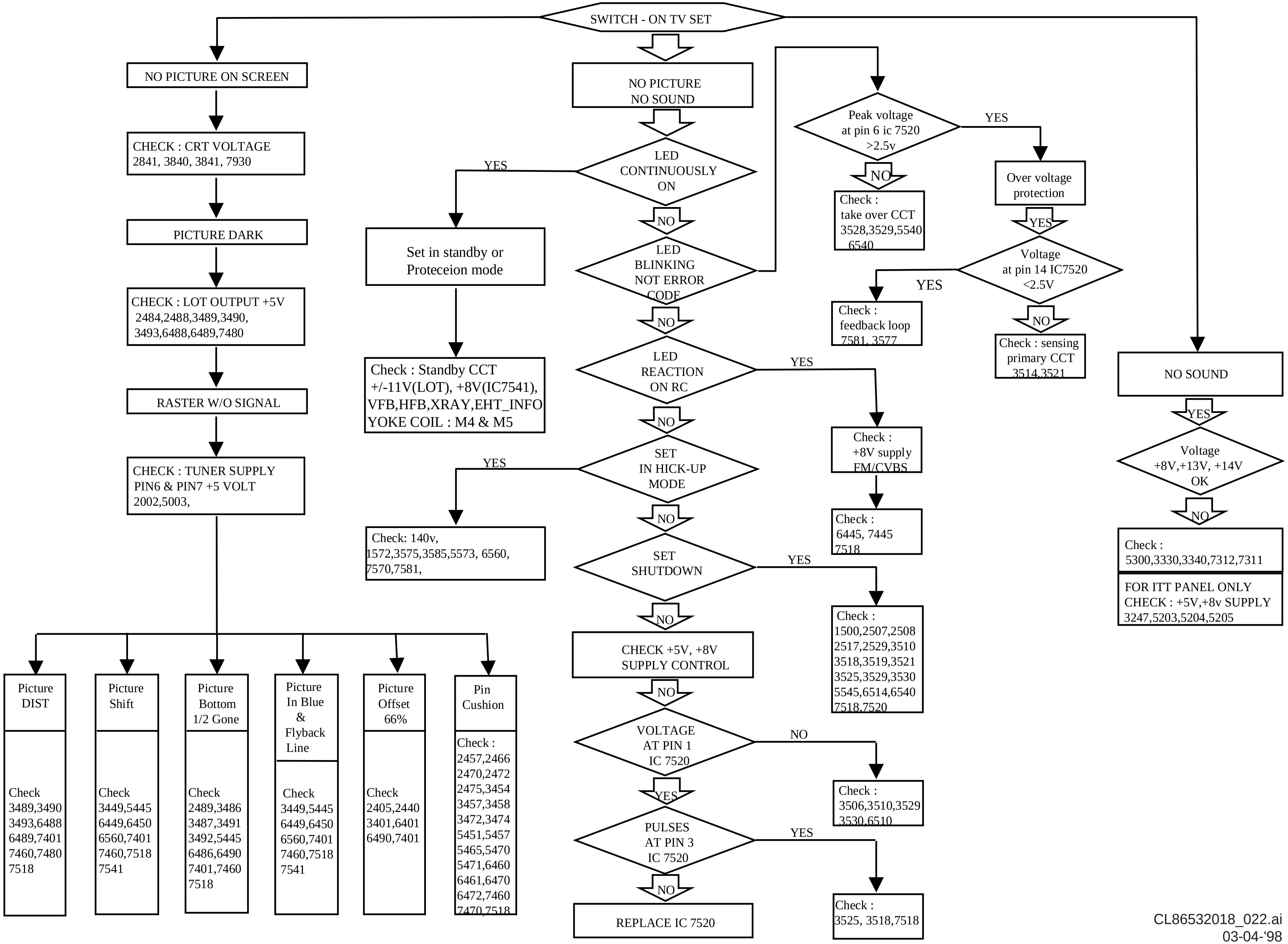
Figure 4-1

5 Faultfinding tree & Repair facilities


SWITCH - ON TV SET
NO PICTURE ON SCREEN
CHECK : CRT VOLTAGE 2841, 3840, 3841, 7930
PICTURE DARK
CHECK : LOT OUTPUT +5V 2484,2488,3489,3490, 3493,6488,6489,7480
RASTER W/O SIGNAL
CHECK : TUNER SUPPLY PIN6 & PIN7 +5 VOLT 2002,5003,
Picture DIST
Check 3489,3490 3493,6488 6489,7401 7460,7480 7518
Picture Shift
Check 3449,5445 6449,6450 6560,7401 7460,7518 7541
Picture Bottom 1/2 Gone
Check 2489,3486 3487,3491 3492,5445 6486,6490 7401,7460 7518
Picture In Blue & Flyback Line
Check 3449,5445 6449,6450 6560,7401 7460,7518 7541
Picture Offset 66%
Check 2405,2440 3401,6401 6490,7401
Pin Cushion
Check : 2457,2466 2470,2472 2475,3454 3457,3458 3472,3474 5451,5457 5465,5470 5471,6460 6461,6470 6472,7460 7470,7518
NO PICTURE NO SOUND
LED CONTINUOUSLY ON
YES
Set in standby or Proteceion mode
Check : Standby CCT +/-11V(LOT), +8V(IC7541), VFB,HFB,XRAY,EHT_INFO YOKE COIL : M4 & M5
NO
LED BLINKING NOT ERROR CODE
NO
LED REACTION ON RC
YES
Check : +8V supply FM/CVBS
Check : 6445, 7445 7518
NO
SET IN HICK-UP MODE
YES
Check: 140v, 1572,3575,3585,5573, 6560, 7570,7581,
NO
SET SHUTDOWN
YES
Check : 1500,2507,2508 2517,2529,3510 3518,3519,3521 3525,3529,3530 5545,6514,6540 7518,7520
NO
CHECK +5V, +8V SUPPLY CONTROL
NO
VOLTAGE AT PIN 1 IC 7520
NO
Check : 3506,3510,3529 3530,6510
YES
PULSES AT PIN 3 IC 7520
YES
Check : 3525, 3518,7518
NO
REPLACE IC 7520
Peak voltage at pin 6 ic 7520 >2.5v
NO
Check : take over CCT 3528,3529,5540 6540
YES
Over voltage protection
YES
Voltage at pin 14 IC7520 <2.5V
YES
Check : feedback loop 7581, 3577
NO
Check : sensing primary CCT 3514,3521
NO SOUND
YES
Voltage +8V,+13V, +14V OK
NO
Check : 5300,3330,3340,7312,7311
FOR ITT PANEL ONLY CHECK : +5V,+8v SUPPLY 3247,5203,5204,5205
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5 Faultfinding tree & Repair facilities

5.1 Repair facilities

5.2 Functional blocks

The PCB has service printing on both sides , so on the copper and the component side. Functional blocks are indicated by lines and text.

Test points are referring to the functional blocks as mentioned above :

- Test pointElectrical function
- P1, P2, etc. :Power supply
- L1, L2, etc. :Line drive and line output
- F1, F2, etc. :Frame drive and frame output
- S1, S2, etc. :Synchronization
- V1, V2, etc.: Video
- A1, A2, etc.: Audio
- C1, C2, etc.:Control
- B1, B2, etc : BTSC stereo decoding
- N1, N2, etc.:NICAM stereo decoding

The numbering is done in for a diagnostics logical sequence.

Example: Checking the power supply, start with test point P1, P2 etc.

5.3 Service mode

The service mode is a pre-defined mode which can be used for faultfinding and adjustments (especially when the TV gives no picture at all you can use the service default mode). All oscillograms and DC voltages in this service manual are measured in the service default mode.

The service mode is split into two parts :

- Service Default Mode (SDM).
- Service Alignment Mode (SAM).

SDM. In the service default mode you are able to carry out (hardware) measurements under pre-defined conditions. To entry the (SDM) Service Default Mode there are two possibilities:

- Via the "DEFAULT" button on the Dealer Service Tool, service codenumber : 4822 218 21232.
- Via Short-circuiting the service pins M24 and M25 on PCB and switching on the set via the mains switch. For M25 and M24 see Diagram A4 and the PWB drawing of the main panel

In the SDM mode a "S" (in green) and the menu (in red) is displayed (see Fig. 1).

SAM. In the SAM mode you are able to align/adjust settings via menu selection. To entry the (SAM) Service Alignment Mode there are two possibilities :

- Via the "ALIGN" button on the Dealer Service Tool
- Via Short-circuiting service pins M28 and M29 on PCB and switching on the set via the mains switch. For M25 and M24 see Diagram A4 and the PWB drawing of the main panel

In the SAM mode a "S" (in green) and the menu (in red) is displayed (see Fig. 2).

REMARKS: After the set is in the service mode the short circuit can be removed.

To leave the Service mode press the stand-by button on the remote control.

REMARKS : After switching off and on the mains switch, the set remains in the service mode (SDM- or SAM mode).

Features are :

- Service settings after entry
- Service (sub) menu selection
- Error buffer display
- Software version and identification display
- Life timer (run timer) display
- Option bytes

5.4 Initial states

The initial state after switching on in service mode for System and Tuning are as follows :

- For Multi-System sets PAL BG/SECAM/DK/NTSC
- For Bi-Norma and Tri-Norma sets NTSC/PAL-M/PAL-N

- For sets with VST tuning : Programme number 1 is selected and the system will be tuned at the tuning data (for programme 1) read from EEPROM
- For sets with PLL tuning : Set is tuned to a frequency of 475.25 MHz.

Further settings :

- The automatic switch off (no IDENT) timer and the sleep timer will be ignored
- The child lock will be disabled.
- If the TV sets was in hotel mode, this mode will be disabled as long as the TV is in service mode.
- Brightness, saturation, sharpness, contrast and balance are initialised to 50% level.
- The volume is set to 25% level.
- The TV is normally controllable.
- All displayed text strings in service mode, so SDM and SAM mode will be displayed in the English language.

Other features

RAM test of the uP (=IC7600) and the NV RAM (=IC7620). At every start-up of the TV, a read after write test for the complete RAM of IC7600 and via I2C the NVRAM (=IC7620) will be performed. If this check fails, the appropriate error number will be written in the error buffer. The patterns will be chosen in such a way that every bit of all bytes, will be written high and low. If the NVRAM is empty default values will be loaded.

5.5 SDM (Service Default Mode)

This menu is being displayed whenever SDM is entered. In this menu the error buffer can be inspected, and the option byte(s) can be (re)programmed. The overview of the menu is shown below :

The MENU UP/DOWN command can be used to select the next/ previous option ; the MENU LEFT/RIGHT command can be used to change the option value.

S (Service mode)

L73AP21 1.0 (Software version)

9999 (Life timer)

5 Faultfinding tree & Repair facilities

AS (options description)	VALUE	8888 7777 66 (options bytes)
ERR (error buffer)	3 4 3 0 0 (error code)	

Explanation :

L73AP21 1.0: The software identification, version and cluster.
AS: A two character short name for the option to be selected. (see table)
VALUE: The value of the selected option.
ERR: Error buffer display
3 4 3 0 0
S: The character " S " indicates that the TV set is in the service mode.
9999: The hexadecimal value of the life timer.
8888 7777 66: 10 digits of value representation of the option byte contents

5.5.1 *Software identification*

If there is a change of the software this number will be changed.

5.5.2 *Life timer (run timer)*

This life timer only counts the normal operations hours and not the stand-by hours. Also at every switch- on the life timer is incremented by 1.

5.5.3 *Option code*

The possible options are listed in the following table 1:

Error buffer

The last five errors, stored in the NVRAM=EEPROM (IC7620), are shown in the service main menu; this is called the errorbuffer. An error will be added to the buffer if this error differs from the last error in the buffer. The last found error is displayed on the left-side.

Example: Suppose the display shows: 3 4 0 0 0. This means the last found error is error number 3, the last found error but one is error number 4, and so on.

- 40000
- 34000

REMARKS: If the (IC7620=) EEPROM is replaced by a new one the set has to be installed according to the option code. The ERROR BUFFER will be erased when the set is switched from service mode in stand by, or via DST code 99.

Error codes

The following error codes have been defined :

- 0 - No error
- 1 - Internal RAM
- 2 - General 12C error
- 3 - EEPROM Configuration error (Checksum error)
- 4 - I2C error (MSP3410 / TDA9850/TDA9860)
- 5 - I2C error (TDA8374)
- 6 - EEPROM error (ST24C04)
- 7 - I2C error (PLL tuner)

5.5.4 *Error code indication via blinking stand by LED*

The ERROR code are also indication via blinking of the standby LED. This is important if no OSD function or picture is available. The method is to show that the LED blinks as many as the error code indicates..

Example: Error code 4 will result in four blinks of the LED (0.25 seconds ON and 0.25 seconds OFF).After this sequence the LED will be OFF for 3 seconds and the blinking of the LED is repeated again.

5.5.5 *Option abbreviation and Option status.*

To select another option abbreviation use the MENU UP/ DOWN buttons and to change the status use the MENU LEFT/ RIGHT buttons.

Elucidation: With above items the option statuses stored in the EEPROM can be changed. This is necessary if the EEPROM is replaced by a fresh EEPROM, because a fresh EEPROM is initial loaded with default options by the uC. The options stored in the factory can differ per type and stroke number. Therefore it is necessary to load the EEPROM with the correct options (configuration). These options are indicated on a sticker glued inside on the rear cover of the set.

Remark: For sets with BTSC sound, also the options TUN.FOA, TUN.FOB, EXT.FOA and EXT.FOB have to be set. See for these items Paragraph 6

Loading a fresh EEPROM

- Switch on the TV via the power switch.
- Audio mute the TV (to get no big noise).
- Change the option codes as indicated on the sticker on the rear cover.
- Put TV in stand by via the remote control.
- Switch on the TV again via the remote control.
- Switch OFF the TV via the power switch
- Switch on the TV again via the power switch.

In the table all the possible option abbreviation with full option name and possible status are listed.

Table 1 : Options description for L7.3 versions.

Full option name	Option name abbreviation	Status Possibilities
Auto cable detect	AC	ON/OFF
AFC Status	AF	ON/OFF
Auto scan	AS	ON/OFF
AVL	AV	ON/OFF
Balance	BL	ON/OFF
Bilingual Mono	BM	ON/OFF
Bass Treble	BT	ON/OFF
Child Lock	CH	ON/OFF
Clock	CK	ON/OFF
Contrast plus	CP	ON/OFF
EW control	EW	ON/OFF

4 : 3 Expend	EX	ON/OFF
Games	GM	ON/OFF
Hospital mode	HS	ON/OFF
Monitor No Ident	NI	ON/OFF
NTSC Play Back	NP	ON/OFF
Spatial	SA	ON/OFF
Sound Board	SB	MA = Mono All
		MM=Multi Mono
		ND = ITT Nicam MSP3410D
		NB = ITT NICAM MSP3410B
		IT = ITT 2CS MSP3400
		50 = TDA 9850
		60 = TDA 9860
		52 = BTSC TDA9852
		55 = BTSC TDA9855
Smart Picture Term Control	SC	ON/OFF
Smart Sound	SS	ON/OFF
Bimos Standby	ST	ON/OFF
Surf	SU	ON/OFF
Multi System	SY	AF = AP FULL MULTI
		SS = SINGLE SYSTEM
		AD = AP DUAL
		AM = AP MULTI
		2N = Binorma
		3N= Trinorma
		4N = Fournorma
Tuner	TN	ON/OFF
Volume Limiter	VL	ON/OFF
Video Mute	VM	ON/OFF
Remote Control	W1	ON/OFF
External 1	XT	ON/OFF
External 2	2X	ON/OFF
TDA884X Family	88	ON/OFF

OPTION code

OPT is the abbreviation of OPTION, this abbreviation refers to the following 12 digit hexadecimal option codes (BFDD FBEF 2C). The option code can not be selected. It only give an quick indication in hexadecimal form of the options settings of the relevant set.

5.6 SAM (Service Alignment Mode)

This menu is being displayed whenever SAM is entered.

In SAM you are able to make tuning adjustments, Alignment of white tone, adjustment of picture geometry, Sound alignment ,VSD and AKB enable/disable (black current loop).

The overview of the menu is shown below :

General: The following items of the sub menus can be selected with the UP(+)/DOWN(-) arrow keys on the user remote control.

Entry into the sub menus is executed with the VOL(+) / VOL(-) arrow keys.

SAM MAINS MENU

		S
AKB	0	
VSD	0	
TUNER	>	
WHITE TONE	>	
GEOMETRY	>	
AUDIO	>	

5.6.1 *AKB*

With the option AKB the "black current loop" can be enabled or disabled. ON =enabled, OFF = disabled.

5.6.2 *TUNER*

With the items TUN.FAO and TUN.FOB the speed (time constant) for internal signals is set. The speed can be set to normal, slow or fast. The tuner sub menu contains the following information :

For monitoring during alignment of AGC,YD,CL, IF-PLL, AFW.

All entered data will be send directly to the video one chip; values are stored in EEPROM if this sub menu is left.

		S
	TUNER	
AGC		37
YD		1
CL		0
IF-PLL		61
AFW		80

AFA	1
AFB	1

5.6.3 White tone

The white tone menu contains the following information :

MAIN WHITE TONE MENU

	S
NORMAL RED	37
DELTA COOL RED	0
DELTA WARM RED	0

NORMAL TEMPERATURE SUB MENU

	S
RED	37
GREEN	37
BLUE	39

REMARK :

Only one of the 3 items (RED, GREEN or BLUE) will be display on the screen. Via "scrolling" with the UP/DOWN keys the items can be changed.

- NORMAL: Via this menu the NORMAL colour temperature alignment can be set.
- DELTA COOL : Via this menu the cool colour temperature alignment can be set
- DELTA WARM : Via this menu the normal warm temperature alignment can be set

Changing any of the items red, green or blue can be changed by first pressing the control left/right keys to highlight the desired setting. With the desired setting highlighted, the user can either increment or decrement the setting by using control up/down key respectively. All changed data will be stored into the EEPROM after returning to the service main menu via the OK key.

The initial default value for all setting is 37.

The factory settings of the colour temperatures are :

NORMAL	10500K	R = 37	G = 37	B = 39
DELTA WARM	8200K	R = 0	G = 254	B = 249
DELTA COOL	14000K	R = 0	G = 1	B = 3

DELTA COOL TEMPERATURE SUB MENU

DELTA COOL RED	0
DELTA COOL GREEN	1
DELTA COOL BLUE	3

DELTA WARM TEMPERATURE SUB MENU

DELTA WARM RED	0
DELTA WARM GREEN	254
DELTA WARM BLUE	249

5.6.4 GEOMETRY

The geometry menu contains the following information :

HSH	Horizontal shift
VSL	Vertical slope
VAM	Vertical amplitude
VSH	Vertical shift
VX	Vertical Zoom
VSC	Vertical Scroll
EW	E-W amplitude
PW	E-W parabola/width
CP	E-W cornerparabola
TC	E-W trapezium
SC	S-Correction
SBL	Service blanking
H60	Delta HSH for 60 Hz
V60	Delta VAM for 60 Hz

	S
HSH	32
VSL	32
VAM	32
VSH	34
VX	13
VSC	39
EW	54
PW	46
CP	39
TC	41
SC	52
SBL	0
H60	10
V60	10

Into the picture geometry menu, the first item will be highlighted and displayed. The value can be incremented or decremented by pressing the control right or left key. The rest of the parameters can be scrolled through by using the control up/down keys.

All changed data will be stored into the EEPROM after returning to the service main menu via the OK key

5.6.5 AUDIO

The sound adjustments sub menu contains the following information :

	S
AUDIO	
AUTO	>
ST-NT	7
SAP-NT	7
LA	7
WIDEB	31
SPECT	31

The TDA9852 sub menu is only available if the BTSC sound IC is present. The settings can be changed by first highlighted the respective item using the control up/down keys and then increment or decrement the value by using the control right or left keys. The default value shown in the diagram are the normal values. For service purposes the normal values can be used

NOTE: The value should not change unless it is absolutely necessary !!!!

5.7 Dealer remote used as a Dealer Service Tool (DST)

With the DST, under mentioned extra service features can be executed.

The main features are :

- Direct entering SDM via the "DEFAULT" button on the DST.
- Direct entering SAM via the "ALIGN" button on the DST.
- Read the error buffer even if the OSD is not working at all. This is done via the blinking LED procedure

REMARKS:

- Entry of the SDM and SAM via the DST is possible in all states, except from stand-by.
- All software is suspended till the dealer remote mode is left.
- The service mode status is left if : the stand-by command is received.

5.8 Downloading of tuning data with the DST

Downloading of tuning data (programme number, frequency and system) via the DST is made possible. This downloading is ONLY possible in the version containing PLL tuning for Europe.

5.9 Blinking LED procedure

Via the DIAGNOSE 1 (for errorbuffer position 1) through the DIAGNOSE 5 (for error 5) commands of the DST, the error buffer can be made visible via the blinking LED. This is useful if the screen is not working properly. The method is to use the LED pulses with as many pulses as the error number, followed by a time period of 3 seconds in which the LED is off. E.g. error code 4 will result in four times the sequence LED on for 0.25 seconds / LED will be off for 0.25 seconds. After this sequence the LED will be off for 3 seconds.

5.10 Hotel-mode

The L7.3 chassis has one special mode, called the hotel mode. In the hotel mode the following occurs:

- Installation menu cannot be entered.
- When entering the hotel mode the maximum volume will be the current value.
- The set will always switch to a selectable channel when set is switched on.

Entering the hotel-mode :

- Select channel 38
- Push the menu button on the local keyboard (vol. + and vol. -) and the OSD-button of the RC simultaneously for 3 seconds; then you are in the hotel mode.

Leaving the hotel mode :

- Same as entering the hotel mode.

The OSD will display the hotel mode "on" or "off".

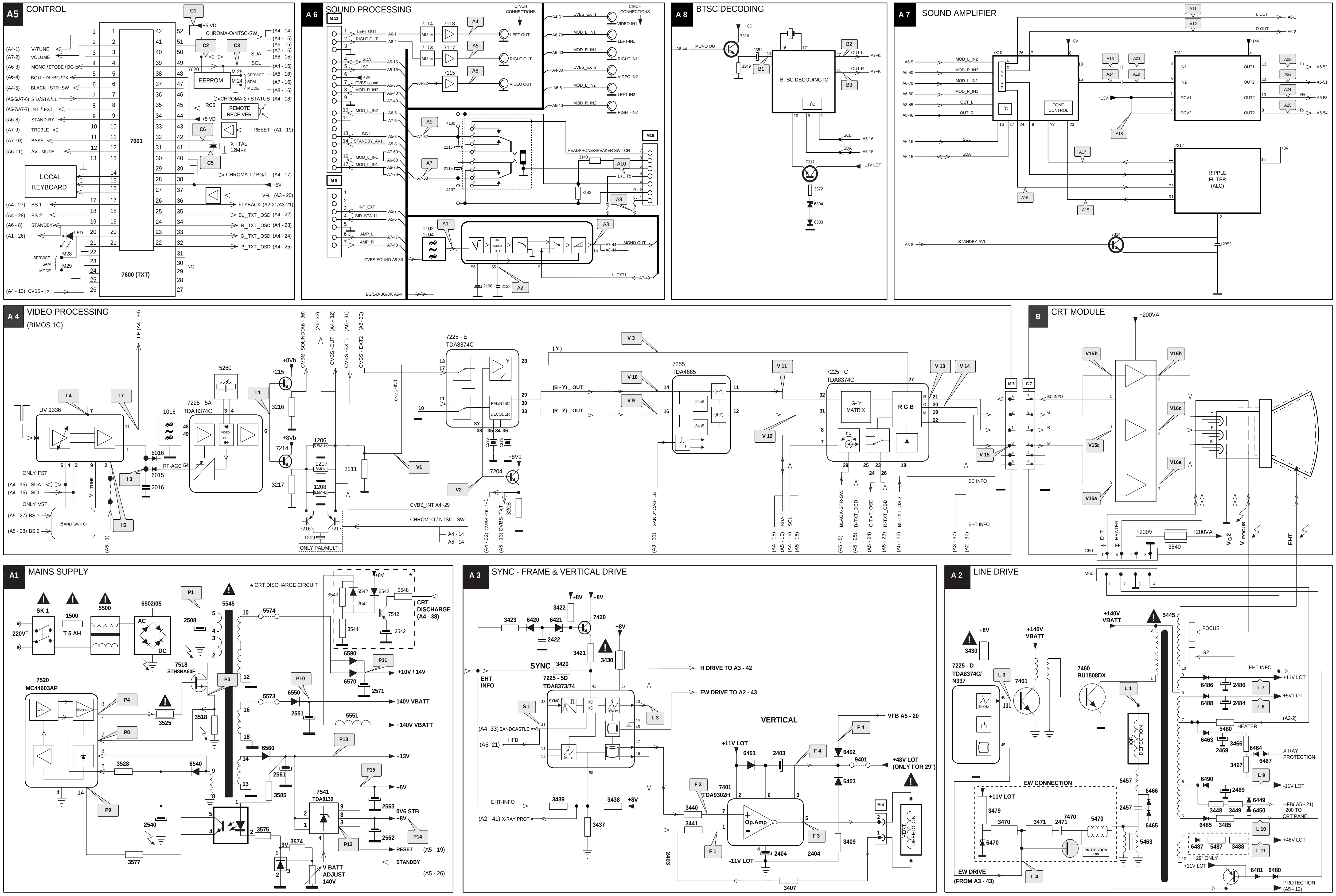
HOTEL MODE SUB MENU " ON "

38	HOTEL ON
HOTEL CHANNEL	38
BLANK FROM	6
TO	6

HOTEL MODE SUB MENU " OFF "

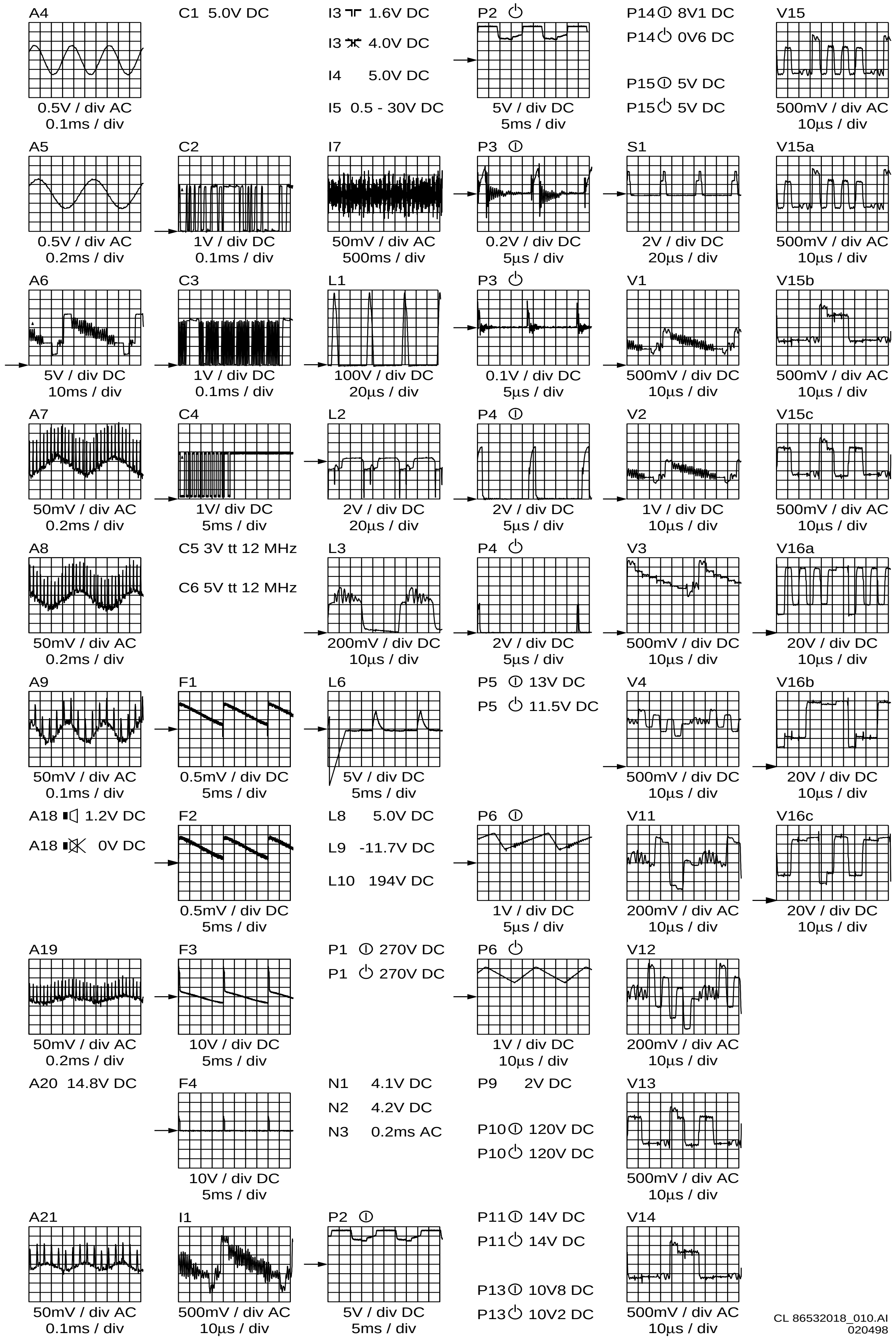
38	HOTEL OFF

6 Block diagram

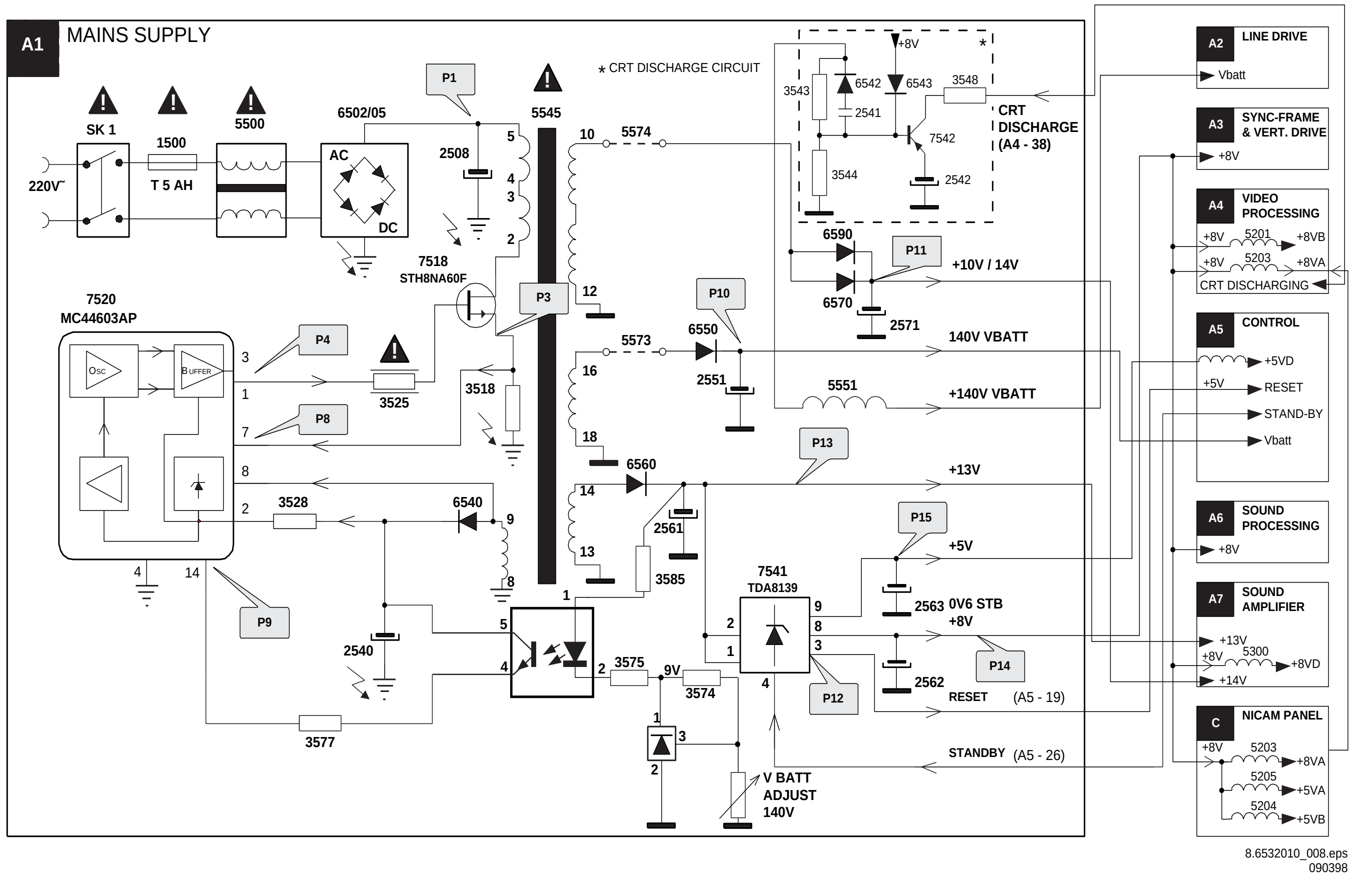

A5 CONTROL
7601
7600 (TXT)
EEPROM
REMOTE RECEIVER
LOCAL KEYBOARD
X - TAL 12MHz
V-TUNE
VOLUME
MONO/STOBE/BG
BG/L - or -BG/DK
BLACK -STR-SW
SID/STA/LL
INT / EXT
STAND-BY
TREBLE
BASS
AV - MUTE
BS 1
BS 2
STANDBY
LED
SERVICE SAM MODE
CVBS-TXT
CHROMA-O/NTSC-SW
SDA
SCL
CHROMA-2 / STATUS
RESET
CHROMA-1 / BG/L
VFL
FLYBACK
BL_TXT_OSD
R_TXT_OSD
G_TXT_OSD
B_TXT_OSD
A 6 SOUND PROCESSING
CINCH CONNECTIONS
LEFT OUT
RIGHT OUT
VIDEO OUT
MUTE
HEADPHONE/SPEAKER SWITCH
MONO OUT
A 8 BTSC DECODING
BTSC DECODING IC
OUT-L
OUT-R
A 7 SOUND AMPLIFIER
TONE CONTROL
RIPPLE FILTER (ALC)
L OUT
R OUT
STANDBY-AVL
A 4 VIDEO PROCESSING (BIMOS 1C)
UV 1336
7225 - 5A TDA 8374C
7225 - E TDA8374C
PAL/NTSC DECODER
7255 TDA4665
7225 - C TDA8374C
G- Y MATRIX
R G B
BAND SWITCH
ONLY PAL/MULTI
RF-AGC
CVBS_INT
CHROM_O / NTSC - SW
SANDCASTLE
EHT INFO
BC INFO
B CRT MODULE
+200VA
FOCUS
EHT
HEATER
A1 MAINS SUPPLY
SK 1
220V~
T 5 AH
AC
DC
7518 STH8NA6F
7520 MC44603AP
OSC
BUFFER
CRT DISCHARGE CIRCUIT
CRT DISCHARGE (A4 - 38)
+10V / 14V
140V VBATT
+140V VBATT
+13V
+5V
0V6 STB
+8V
RESET
STANDBY
7541 TDA8139
V BATT ADJUST 140V
A 3 SYNC - FRAME & VERTICAL DRIVE
SYNC
7225 - 5D TDA8373/74
H DRIVE TO A3 - 42
EW DRIVE TO A2 - 43
VERTICAL
7401 TDA9302H
Op.Amp
VFB A5 - 20
+48V LOT (ONLY FOR 29")
-11V LOT
VERT. DEFLECTION
EHT-INFO
X-RAY PROT
A 2 LINE DRIVE
7225 - D TDA8374C/ N337
7461
7460 BU1508DX
+140V VBATT
HOR. DEFLECTION
EW CONNECTION
PROTECTION E/W
EW DRIVE (FROM A3 - 43)
+11V LOT
+5V LOT
X-RAY PROTECTION
-11V LOT
HFB(A5 - 21) +200 TO CRT PANEL
+48V LOT
29" ONLY
PROTECTION (A5 - 12)

8.6532010_006.eps
110398

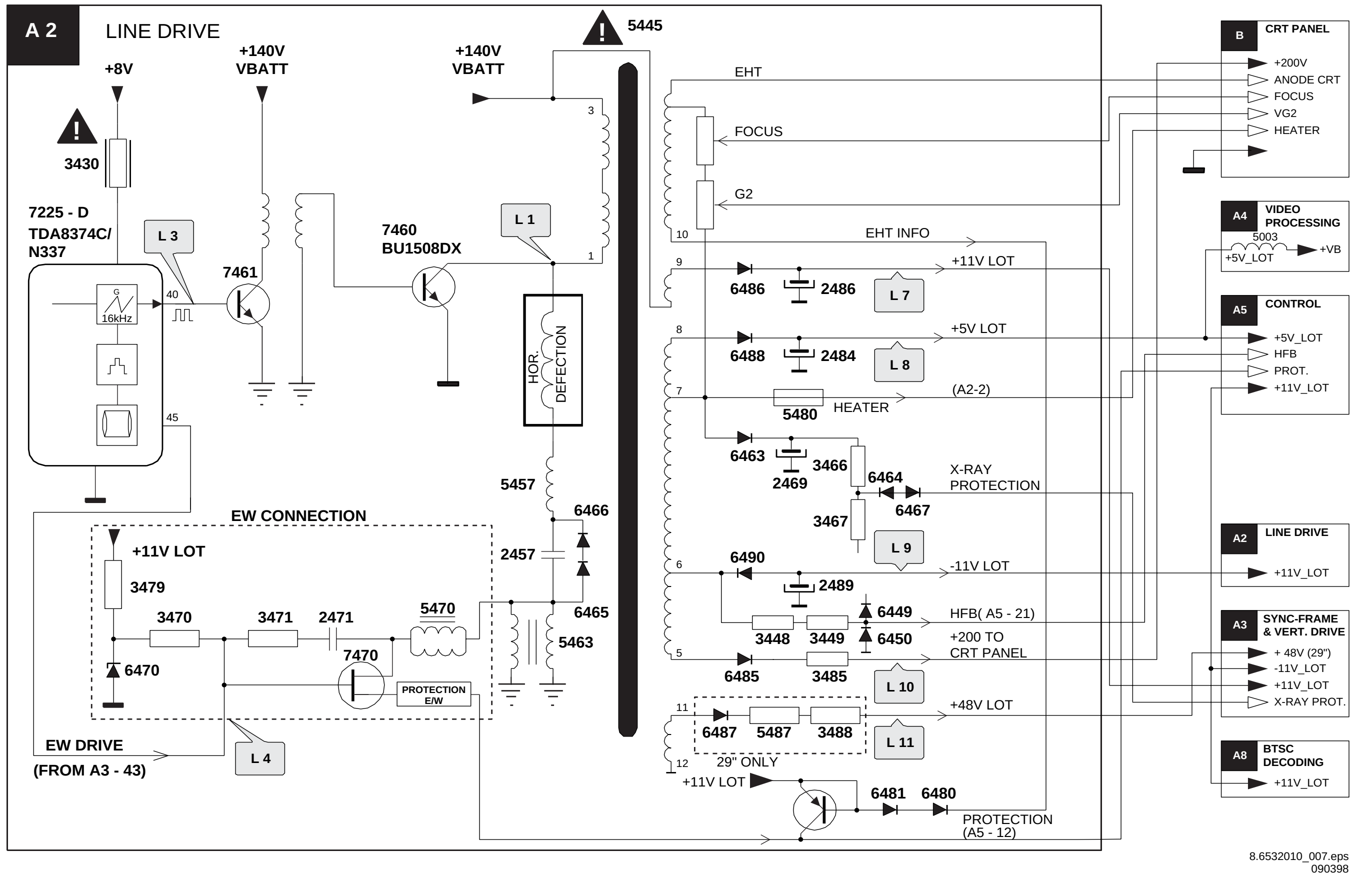
6 Block diagram



CL 86532018_010.AI
020498

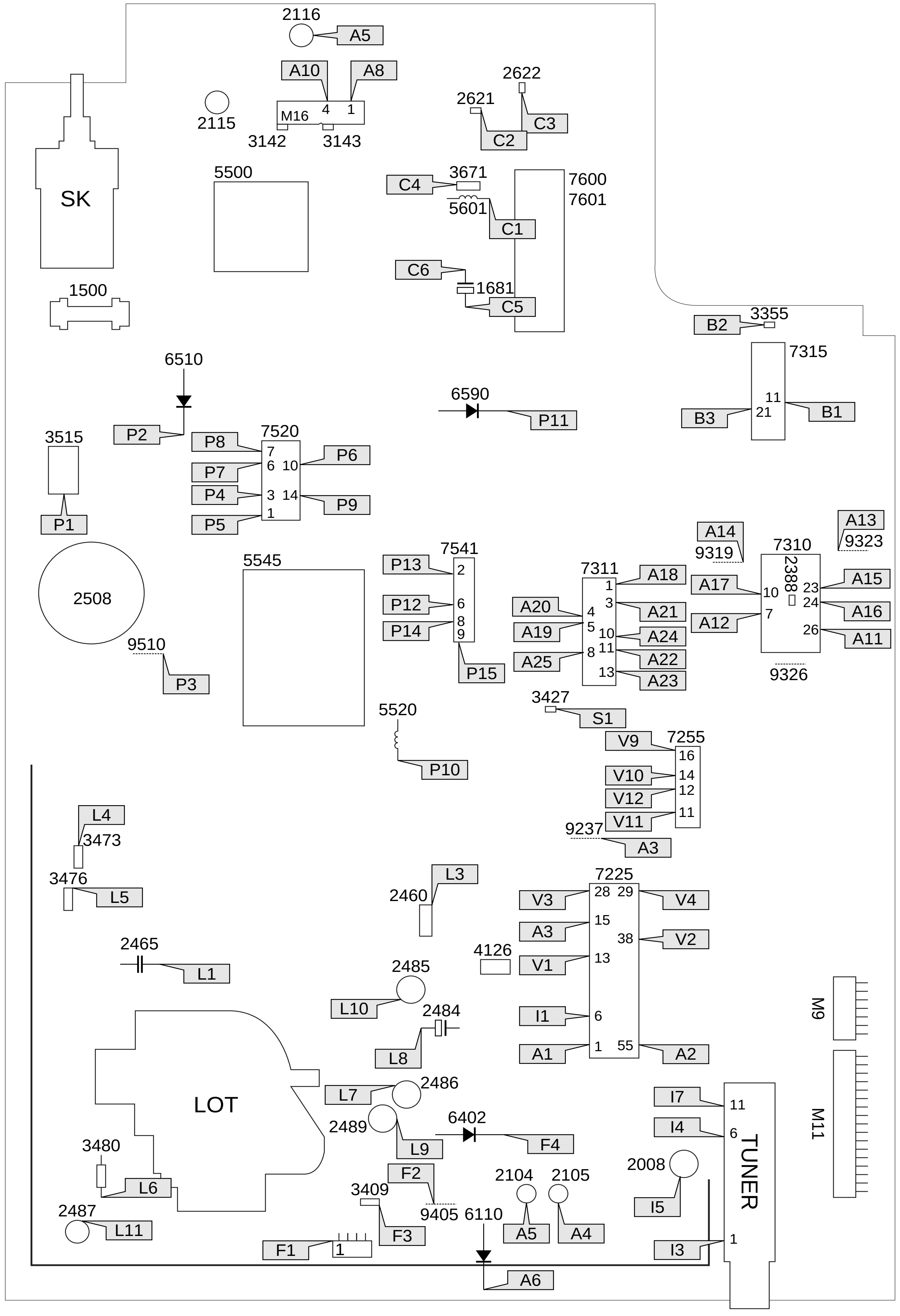

A1
MAINS SUPPLY
SK 1
1500
T 5 AH
220V~
5500
6502/05
AC
DC
2508
P1
5545
* CRT DISCHARGE CIRCUIT
10
5574
5
4
3
2
7518
STH8NA60F
P3
12
7520
MC44603AP
OSC
BUFFER
P4
P8
3525
3518
5573
16
18
6550
P10
2551
5551
140V VBATT
+140V VBATT
6560
14
13
P13
+13V
3528
6540
9
8
2561
3585
P15
+5V
7541
TDA8139
2563
0V6 STB
+8V
2540
P9
3575
9V
3574
P12
P14
2562
RESET (A5 - 19)
STANDBY (A5 - 26)
3577
V BATT
ADJUST
140V
3543
6542
6543
3548
2541
7542
3544
2542
CRT
DISCHARGE
(A4 - 38)
6590
P11
+10V / 14V
6570
2571
A2 LINE DRIVE
Vbatt
A3 SYNC-FRAME & VERT. DRIVE
+8V
A4 VIDEO PROCESSING
+8V 5201 +8VB
+8V 5203 +8VA
CRT DISCHARGING
A5 CONTROL
+5VD
+5V
RESET
STAND-BY
Vbatt
A6 SOUND PROCESSING
+8V
A7 SOUND AMPLIFIER
+13V
+8V 5300 +8VD
+14V
C NICAM PANEL
+8V 5203 +8VA
5205 +5VA
5204 +5VB

8.6532010_008.eps
090398

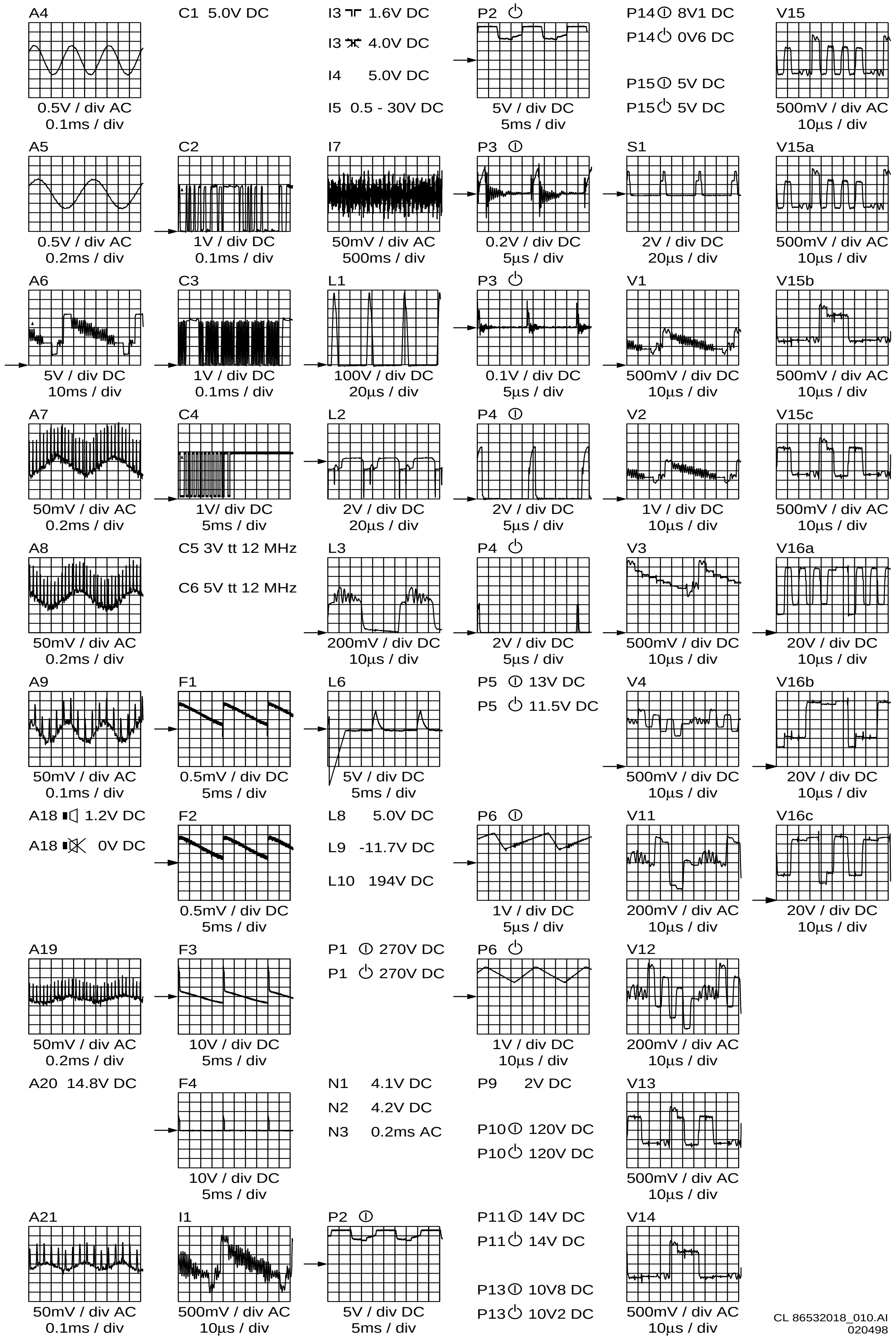

A 2
LINE DRIVE
+8V
+140V VBATT
+140V VBATT
5445
3430
7225 - D
TDA8374C/
N337
16kHz
40
45
L 3
7461
7460
BU1508DX
L 1
HOR. DEFECTION
EHT
FOCUS
G2
EHT INFO
+11V LOT
6486
2486
L 7
+5V LOT
6488
2484
L 8
5480
HEATER
(A2-2)
6463
2469
3466
6464
6467
X-RAY PROTECTION
3467
L 9
6490
2489
-11V LOT
6449
6450
HFB(A5 - 21)
+200 TO CRT PANEL
3448
3449
6485
3485
L 10
6487
5487
3488
L 11
+48V LOT
29" ONLY
+11V LOT
6481
6480
PROTECTION (A5 - 12)
5457
6466
2457
6465
5463
EW CONNECTION
+11V LOT
3479
3470
3471
2471
5470
7470
PROTECTION E/W
6470
EW DRIVE
(FROM A3 - 43)
L 4
B CRT PANEL
+200V
ANODE CRT
FOCUS
VG2
HEATER
A4 VIDEO PROCESSING
5003
+5V_LOT
+VB
A5 CONTROL
+5V_LOT
HFB
PROT.
+11V_LOT
A2 LINE DRIVE
+11V_LOT
A3 SYNC-FRAME & VERT. DRIVE
+ 48V (29")
-11V_LOT
+11V_LOT
X-RAY PROT.
A8 BTSC DECODING
+11V_LOT

8.6532010_007.eps
090398

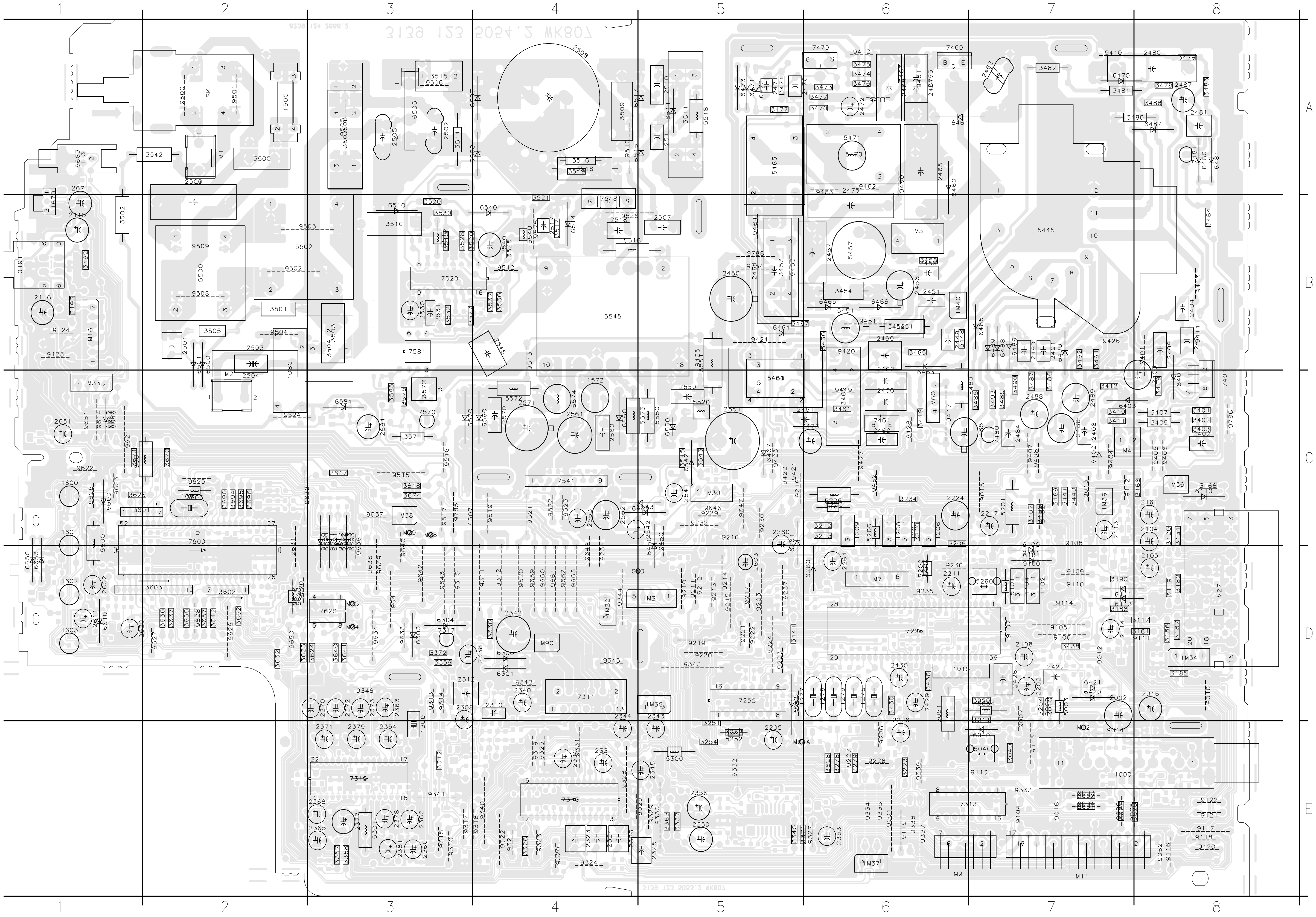
6 Block diagram


SK
2116
A5
A10
A8
M16
4
1
2115
3142
3143
2622
2621
C2
C3
5500
C4
3671
5601
C1
7600
7601
C6
1681
C5
1500
B2
3355
7315
6510
6590
P11
B3
11
21
B1
3515
P2
P8
7520
7
6
10
P6
P7
P4
3
14
P9
P5
1
P1
A13
9323
A14
9319
7310
2388
A17
10
23
24
A15
A16
A12
7
26
A11
9326
2508
5545
P13
7541
2
P12
6
P14
8
9
P15
7311
A18
1
3
A20
4
A21
A19
5
10
A24
A25
8
11
A22
13
A23
9510
P3
5520
3427
S1
V9
7255
16
P10
V10
14
12
V12
V11
11
9237
A3
L4
3473
3476
L5
L3
2460
7225
V3
28
29
V4
15
A3
38
V2
4126
V1
13
2465
L1
2485
L10
2484
I1
6
L8
A1
1
55
A2
M9
LOT
L7
2486
2489
6402
L9
F4
I7
11
I4
6
M11
3480
F2
2104
2105
2008
TUNER
L6
3409
9405
6110
A5
A4
I5
2487
L11
F3
F1
1
I3
1
A6

CL 86532018_001.AI
010498



CL 86532018_010.AI
020498



M1	A2
M2	C2
M4	C7
M5	B6
M7	D6
M9	E6
GND	D4
M11	E7
M12	D7
M16	B1
M24	D3
M25	D3
M27	D8
M28	C3
M29	C3
M60	C6
M90	D4
SK1	A2
0191	B1
1000	E7
1015	D6
1080	B2
1102	D7
1104	D7
1206	C6
1207	C6
1208	C6
1209	C6
1275	D6
1277	D6
1278	D6
1279	D6
1300	E3
1500	A2
1572	C4
1600	C1
1601	D1
1602	D1
1603	D1
1670	B1
1681	C2
2002	D7
2016	D8
2104	C8
2105	D8
2108	D7
2113	C7
2114	D7
2115	B1
2116	B1
2161	C8
2202	D7
2205	E5
2211	D6
2217	C7
2224	C6
2226	D6
2260	C5
2261	D6
2308	E3
2310	D4
2312	D3
2323	E4
2324	E4
2325	E5
2326	E4
2330	E4
2331	E4
2338	D4
2340	D4
2342	D4
2343	E5
2344	E4
2345	E5
2350	E5
2353	E6
2356	E5
2360	E3
2362	E3
2363	D3
2364	E3
2365	E3
2368	E3
2370	D3
2371	E3
2372	D3
2373	D3
2377	E3
2378	E3
2379	E3
2381	E3
2401	B8
2402	C8
2403	C7
2404	B8
2408	C7
2409	B8
2422	D7
2426	D7
2429	D6
2430	D6
2448	B6
2450	B5
2451	B6
2456	C6
2457	B6
2458	B6
2459	B6
2460	C6
2461	C5
2462	C6
2463	A7
2464	B5
2465	A6
2466	A6
2467	A6
2468	A6
2469	B6
2470	A5
2471	A5
2472	A6
2473	C6
2475	B6
2480	A7
2481	A8
2484	C7
2485	C7
2486	C7
2487	A8
2488	C7
2489	C7
2490	B7
2491	B7
2500	A2
2501	B2
2502	A3
2503	B2
2504	B2
2505	A3
2507	B5
2508	A4
2510	A5
2511	A5
2517	B4
2518	B4
2530	B3
2531	B3
2540	B4
2541	C5
2542	C4
2545	B4
2550	C5
2551	C5
2560	C4
2561	C4
2562	C4
2563	C4
2570	C4
2571	C4
2602	D1
2603	D5
2611	D1
2630	D1
2651	C1
2671	A1
2884	C3
3001	E7
3002	E7
3016	E7
3020	E8
3022	E7
3040	E7
3041	E7
3050	D7
3106	C7
3107	C7
3117	D8
3119	D8
3120	C8
3131	C8
3141	D5
3166	C8
3168	C8
3169	C7
3181	D8
3185	D8
3186	D8
3187	D8
3188	D7
3189	D8
3190	D7
3192	B1
3193	B1
3204	D7
3206	D6
3210	D6
3212	C6
3213	C6
3223	E6
3234	C6
3251	D5
3252	E5
3254	E5
3278	E6
3279	E6
3312	E3
3328	E4
3330	D4
3337	E5
3340	E5
3357	E3
3358	E3
3359	D3
3363	E5
3371	E5
3372	D3
3401	C8
3402	C8
3403	C8
3405	C8
3407	C8
3409	C8
3410	C7
3411	C7
3412	C7
3430	D6
3436	D6
3438	D7
3440	C7
3441	C7
3448	B6
3449	C6
3451	B6
3452	B6
3453	B5
3454	B6
3458	B6
3461	C6
3462	C6
3463	A6
3465	B6
3466	B6
3467	B6
3470	A6
3471	A5
3472	A6
3473	A6
3474	A6
3475	A6
3476	A6
3477	A5
3478	A8
3479	A8
3480	A7
3481	A7
3482	A7
3483	A8
3484	B8
3485	C7
3486	C7
3487	C7
3488	A8
3489	C7
3490	C7
3491	B7
3492	B7
3493	C7
3500	A2
3501	B2
3502	B1
3503	B3
3504	B3
3505	B2
3506	A3
3507	A3
3509	A4
3510	B3
3511	A5
3513	B3
3514	A3
3515	A3
3516	A4
3517	B4
3518	A4
3519	A4
3520	B3
3521	B4
3525	B4
3528	B3
3529	B4
3530	B3
3532	B3
3536	B4
3537	B4
3542	A2
3543	C5
3545	C5
3571	C3
3572	C3
3575	C3
3577	B4
3585	C3
3601	C2
3602	D2
3603	D2
3617	C3
3618	C3
3624	D3
3625	D2
3626	C1
3628	E6
3632	D2
3636	D2
3637	D2
3640	D3
3641	D3
3642	D2
3655	D2
3657	D2
3662	D2
3670	C2
3671	C1
3674	C3
3690	C2
3694	C2
3695	C2
3696	C2
5003	D7
5040	E7
5051	D6
5054	D7
5101	D7
5201	C7
5202	D6
5203	C6
5205	C6
5206	C6
5252	E5
5260	D7
5300	E5
5301	E3
5445	A7
5451	B6
5457	B6
5460	C5
5461	C5
5463	A5
5465	A5
5470	A6
5471	A6
5480	C7
5500	B2
5502	A2
5515	B3
5516	B4
5518	A5
5520	C5
5540	B4
5545	C5
5550	C5
5551	B5
5572	C4
5573	C4
5574	C4
5600	C1
5601	C2
5603	C2
5620	D2
6040	E7
6100	D7
6101	D7
6110	C8
6111	D8
6113	D8
6254	E5
6260	D6
6261	C5
6300	D4
6301	D4
6303	D3
6304	D3
6401	B8
6402	C7
6403	C7
6420	D7
6421	D7
6449	C4
6450	D5
6460	B6
6461	A6
6463	B6
6464	B5
6465	B6
6466	B6
6467	C5
6470	A7
6471	A5
6472	A5
6473	A5
6480	A8
6481	A8
6485	B7
6486	B7
6487	A8
6488	B7
6489	B7
6490	B7
6500	B2
6501	C2
6505	A3
6507	A3
6508	A4
6510	B3
6511	A5
6514	B4
6515	A4
6517	A5
6540	B4
6542	C5
6543	C5
6550	C5
6560	C4
6570	C3
6584	C3
6590	C4
6600	C1
6610	D1
6650	D1
6653	D1
6661	C1
6663	A1
6690	C3
6691	C3
6692	C3
6693	C3
7225	D6
7255	E5
7310	E4
7311	D4
7313	E6
7315	E3
7317	D3
7401	B8
7460	A6
7461	C6
7470	A5
7480	C7
7481	A8
7518	B4
7520	B3
7541	C4
7570	C3
7581	B3
7600	C1
7620	D3
9001	E6
9003	E7
9004	E7
9005	E8
9006	E7
9007	D7
9008	E7
9010	D8
9012	D7
9013	C7
9014	E7
9015	C7
9016	E7
9052	E8
9100	D7
9101	D7
9102	C7
9104	E7
9105	D7
9106	D7
9107	D7
9108	C7
9109	D7
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9114	D7
9115	E7
9116	E8
9117	E8
9118	E8
9119	E6
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9121	E8
9122	E8
9123	B1
9124	B1
9202	D6
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9214	D5
9215	D5
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9339	E6
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9343	D5
9344	D4
9345	D4
9346	D3
9401	B8
9404	C7
9405	C8
9406	C8
9407	C7
9408	C7
9410	A7
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9412	A6
9413	B8
9414	B8
9417	C6
9419	C6
9420	B6
9421	C5
9422	C5
9423	C5
9424	B5
9425	B5
9426	B7
9427	C6
9428	C6
9450	C5
9451	B6
9452	C6
9453	B5
9460	A6
9461	A6
9462	A6
9463	B6
9464	B5
9500	A2
9501	A2
9502	B2
9503	B2
9504	B2
9505	A3
9506	A3
9507	C3
9508	B2
9509	B2
9510	A4
9512	B4
9513	B4
9515	C3
9516	C3
9517	C3
9519	C4
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9522	C4
9523	C4
9524	C2
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9526	B4
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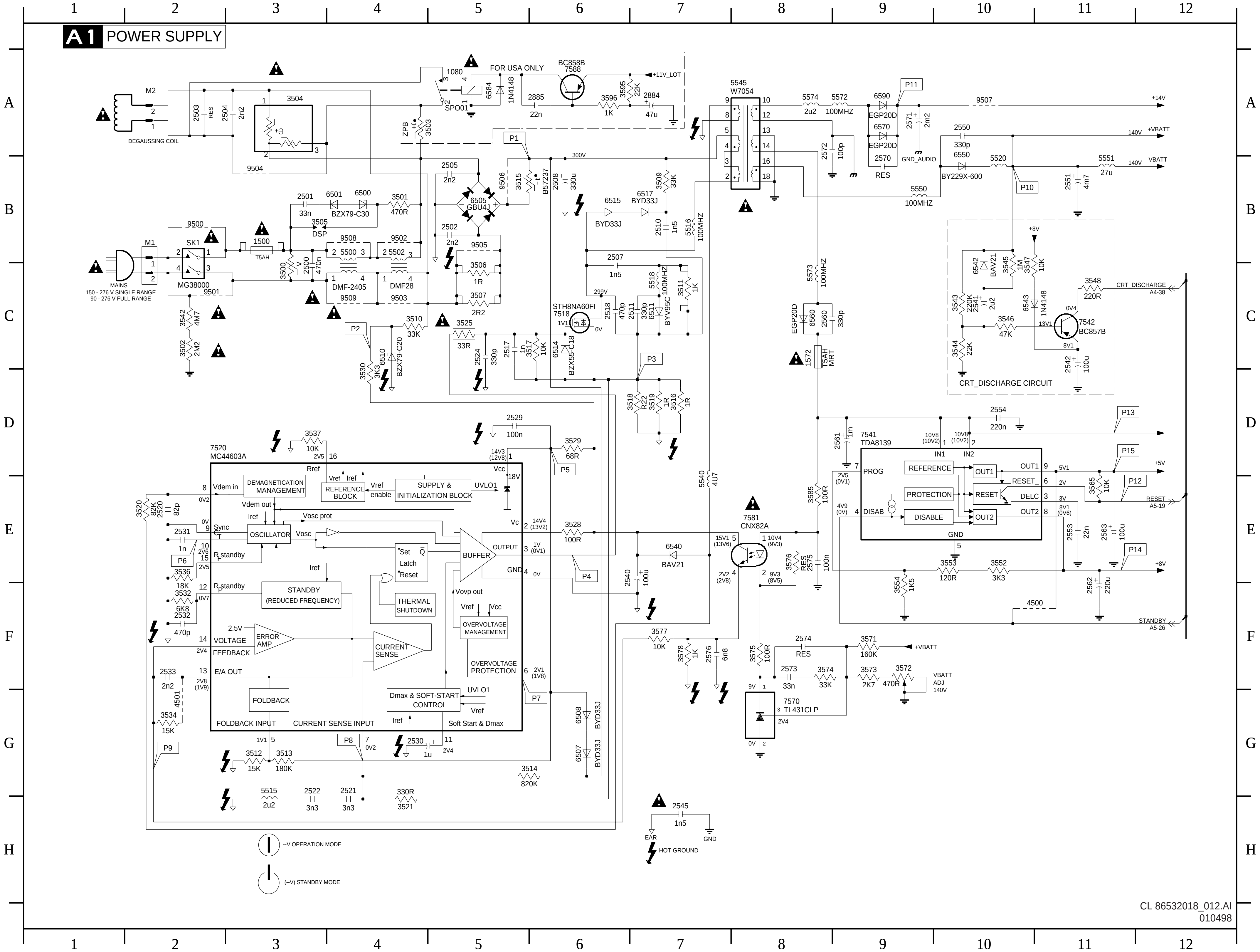
9626	C1
9627	D2
9628	D2
9629	D2
9631	D2
9632	C3
9633	D3
9634	D3
9636	D3
9637	C3
9638	D3
9639	D3
9640	D3
9641	D3
9642	D3
9643	D3
9644	D4
9646	C5
9647	C5
9649	C1
9650	D2
9651	C1
9659	D4
9660	D4
9661	D4
9662	D4
9663	D4
9754	B5
9785	C3
9786	C8
9788	B5
IM30	C5
IM31	D5
IM32	D4
IM33	C1
IM34	D8
IM35	D5
IM36	C8
IM37	E6
IM38	C3
IM39	C7
IM40	B6
M84A	E5

A1 POWER SUPPLY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A B C D E F G H
M2
DEGAUSSING COIL
2503
RES
2504
2n2
3504
9504
FOR USA ONLY
1080
SPO01
ZPB
3503
6584
1N4148
2885
22n
BC858B
7588
3596
1K
3595
22K
2884
47u
+11V_LOT
P1
2505
2n2
6505
GBU4J
9506
3515
B57237
2508
330u
300V
2501
33n
6501
6500
BZX79-C30
3501
470R
3505
DSP
2502
2n2
9505
3506
1R
3507
2R2
9500
M1
SK1
1500
T5AH
MG38000
MAINS
150 - 276 V SINGLE RANGE
90 - 276 V FULL RANGE
9501
3500
2500
470n
9508
5500
9502
5502
DMF-2405
DMF28
9509
9503
3542
4M7
3502
2M2
P2
3530
3K3
6510
BZX79-C20
3510
33K
3525
33R
2524
330p
2517
1n
3517
10K
6514
BZX55-C18
STH8NA60FI
7518
2518
470p
2511
330p
6511
BYV95C
2507
1n5
5518
100MHZ
3511
1K
6515
BYD33J
6517
BYD33J
3509
33K
2510
1n5
5516
100MHZ
P3
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R22
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1R
3516
1R
5545
W7054
5574
2u2
5572
100MHZ
2572
100p
6590
EGP20D
6570
EGP20D
2570
RES
GND_AUDIO
2571
2m2
P11
9507
+14V
2550
330p
6550
BY229X-600
5520
140V
+VBATT
5551
27u
VBATT
2551
4m7
P10
5550
100MHZ
5573
100MHZ
6560
EGP20D
2560
330p
1572
T5AH
MRT
+8V
6542
BAV21
3545
1M
3547
10K
3543
220K
2541
2u2
6543
1N4148
3548
220R
CRT_DISCHARGE
A4-38
3546
47K
7542
BC857B
3544
22K
2542
100u
CRT_DISCHARGE CIRCUIT
2554
220n
P13
2561
1m
7541
TDA8139
IN1
IN2
PROG
REFERENCE
OUT1
PROTECTION
RESET
DELC
DISAB
DISABLE
OUT2
GND
P15
+5V
3565
10K
P12
RESET
A5-19
2553
22n
2563
100u
P14
+8V
3553
120R
3552
3K3
3554
1K5
2562
220u
4500
STANDBY
A5-26
3585
100R
3576
RES
2575
100n
7581
CNX82A
5540
4U7
7520
MC44603A
3537
10K
2529
100n
3529
68R
P5
DEMAGNETICATION MANAGEMENT
REFERENCE BLOCK
SUPPLY & INITIALIZATION BLOCK
UVLO1
Vdem in
Vdem out
Vosc prot
Sync
OSCILLATOR
Vosc
Set
Latch
Reset
BUFFER
OUTPUT
GND
Vc
Vcc
R standby
STANDBY (REDUCED FREQUENCY)
THERMAL SHUTDOWN
OVERVOLTAGE MANAGEMENT
VOLTAGE FEEDBACK
ERROR AMP
CURRENT SENSE
OVERVOLTAGE PROTECTION
E/A OUT
FOLDBACK
Dmax & SOFT-START CONTROL
FOLDBACK INPUT
CURRENT SENSE INPUT
Soft Start & Dmax
3528
100R
P4
6540
BAV21
2540
100u
3520
82K
2520
82p
2531
1n
P6
3536
18K
3532
6K8
2532
470p
2533
2n2
4501
3534
15K
P9
3512
15K
3513
180K
P8
2530
1u
P7
3514
820K
6508
BYD33J
6507
BYD33J
5515
2u2
2522
3n3
2521
3n3
330R
3521
3577
10K
3578
1K
2576
6n8
3575
100R
2574
RES
3571
160K
+VBATT
2573
33n
3574
33K
3573
2K7
3572
470R
VBATT ADJ 140V
7570
TL431CLP
2545
1n5
EAR
GND
--V OPERATION MODE
(--V) STANDBY MODE
HOT GROUND

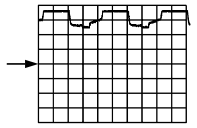
CL 86532018_012.AI
010498

M1	B2
M2	A2
SK1	B2
1080	A5
1500	B3
1572	C8
2500	C3
2501	B3
2502	B5
2503	A2
2504	A3
2505	B5
2507	B6
2508	B6
2510	B7
2511	C7
2517	C5
2518	C6
2520	E2
2521	G4
2522	G3
2524	C5
2529	D5
2530	G4
2531	E2
2532	F2
2533	F2
2540	E6
2541	C10
2542	C11
2545	H7
2550	A10
2551	B11
2553	E11
2554	D10
2560	C8
2561	D9
2562	F11
2563	E11
2570	B9
2571	A9
2572	A8
2573	F8
2574	F8
2575	E8
2576	F7
2884	A7
2885	A6
3500	C3
3501	B4
3502	C2
3503	A4
3504	A3
3505	B3
3506	C5
3507	C5
3509	B7
3510	C4
3511	C7
3512	G3
3513	G3
3514	G6
3515	B5
3516	D7
3517	C6
3518	D7
3519	D7
3520	E2
3521	H4
3525	C5
3528	E6
3529	D6
3530	D4
3532	F2
3534	G2
3536	E2
3537	D3
3542	C2
3543	C10
3544	C10
3545	C10
3546	C10
3547	C10
3548	C11
3552	E10
3553	E10
3554	F9
3565	E11
3571	F9
3572	F9
3573	F9
3574	F8
3575	F8
3576	E8
3577	F7
3578	F7
3585	E8
3595	A6
3596	A6
4500	F11
4501	G2
5500	B4
5502	B4
5515	G3
5516	B7
5518	C7
5520	B10
5540	E7
5545	A7
5550	B9
5551	B11
5572	A9
5573	C8
5574	A8
6500	B4
6501	B4
6505	B5
6507	G6
6508	G6
6510	C4
6511	C7
6514	C6
6515	B6
6517	B7
6540	E7
6542	C10
6543	C10
6550	B10
6560	C8
6570	A9
6584	A5
6590	A9
7518	C6
7520	D2
7541	D9
7542	C11
7570	G8
7581	E8
7588	A6
9500	B2
9501	C2
9502	B4
9503	C4
9504	B3
9505	B5
9506	B5
9507	A10
9508	B4
9509	C4

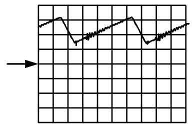
P1 ⏽ 270V DC
P1 ⏻ 270V DC

P5 ⏽ 13V DC
P5 ⏻ 11.5V DC

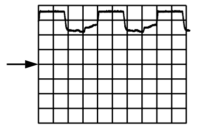
P2 ⏽


5V / div DC
5ms / div

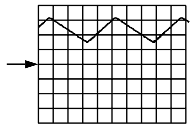
P6 ⏽


1V / div DC
5µs / div

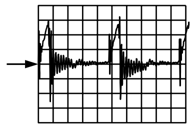
P2 ⏻


5V / div DC
5ms / div

P6 ⏻


1V / div DC
10µs / div

P3 ⏽

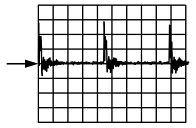

0.2V / div DC
5µs / div

P9 2V DC

P10⏽ 120V DC
P10⏻ 120V DC

P11⏽ 14V DC
P11⏻ 14V DC

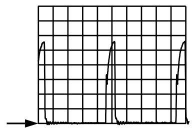
P3 ⏻


0.1V / div DC
5µs / div

P13⏽ 10V8 DC
P13⏻ 10V2 DC

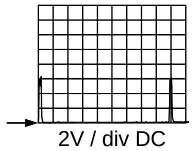
P14⏽ 8V1 DC
P14⏻ 0V6 DC

P4 ⏽

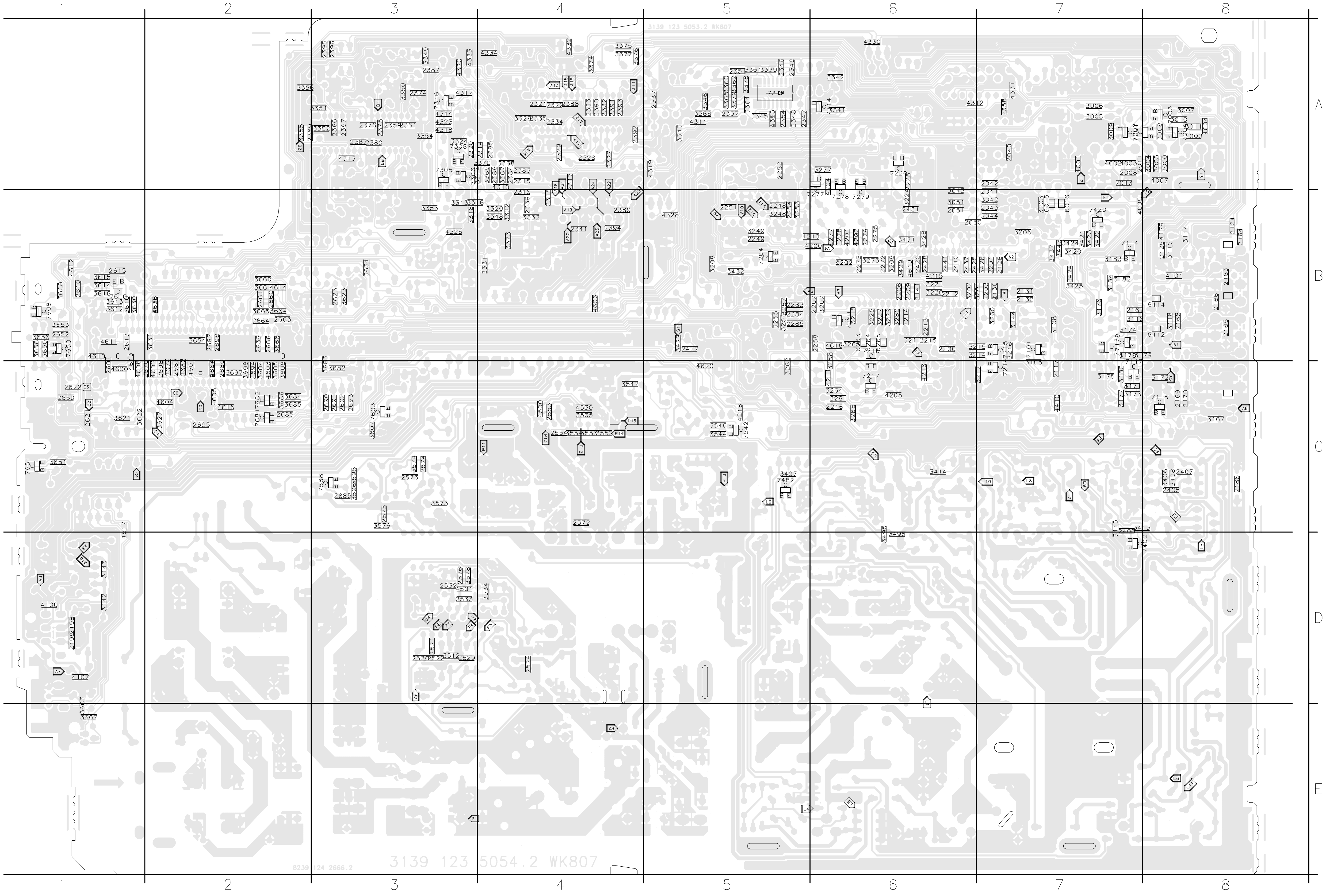

2V / div DC
5µs / div

P15⏽ 5V DC
P15⏻ 5V DC

P4 ⏻


2V / div DC
5µs / div

CL 86532018_002.AI
270398



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2005	A8
2008	A7
2009	A8
2011	A8
2013	A7
2040	A7
2041	B6
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2044	B7
2050	B6
2051	B6
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2125	B8
2128	B7
2130	B7
2131	B7
2132	B7
2141	B6
2163	B8
2164	B8
2165	B8
2166	B8
2167	B7
2168	B8
2169	C8
2170	C8
2186	C8
2198	D1
2199	D1
2200	B6
2201	B7
2203	B7
2206	B6
2207	B6
2209	B6
2212	B6
2213	B6
2214	B6
2215	B6
2216	C6
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2397	A3
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3009	A7
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3184	B7
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3208	B5
3209	B6
3211	B6
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3216	B7
3217	C7
3218	B6
3220	B6
3221	B6
3224	B6
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3256	B5
3257	B5
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3262	C5
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3264	C6
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3273	B6
3277	A6
3280	B6
3313	B3
3314	A3
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3318	B3
3320	B4
3322	B4
3324	A3
3329	A4
3331	B4
3332	B4
3339	A5
3341	A6
3342	A6
3343	A5
3345	A5
3346	A5
3348	B4
3349	A3
3350	A3
3351	A2
3352	A3
3353	B3
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3355	A2
3356	A2
3360	A5
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3364	A5
3365	A5
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3367	A4
3368	A4
3369	B4
3370	A4
3373	B4
3374	A4
3375	A4
3376	A4
3377	A4
3378	A5
3379	A5
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3408	C8
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3423	B7
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3651	C1
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3654	B2
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3660	B2
3661	B2
3663	E1
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3682	C3
3683	C3
3684	C2
3685	C2
3686	C2
3697	C2
3698	B2
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4002	A7
4003	A7
4004	A8
4005	B8
4007	A8
4100	D1
4101	B8
4107	D1
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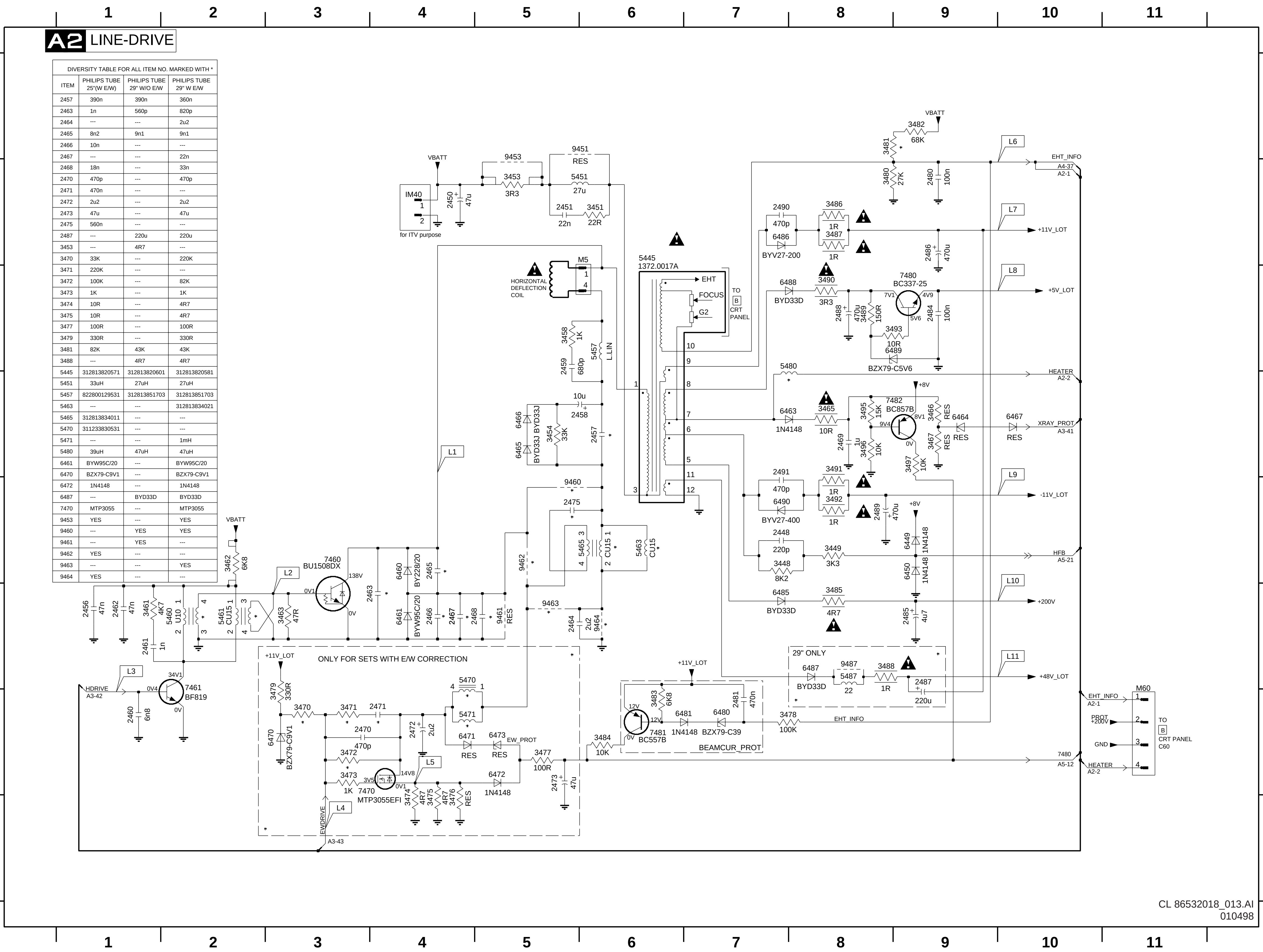
4200	B6
4201	B6
4202	B6
4203	B6
4204	B6
4205	C6
4210	B6
4211	C6
4215	B6
4216	C6
4218	C5
4310	A4
4311	A5
4312	A7
4313	A3
4314	A3
4315	A5
4317	A3
4318	A3
4319	A5
4320	A3
4323	A3
4326	B3
4328	B5
4330	A6
4331	A7
4332	A4
4333	A3
4334	A4
4410	C7
4500	C4
4501	D3
4530	C4
4600	C1
4601	B2
4602	B2
4603	B2
4604	C2
4605	C2
4606	B4
4607	C2
4608	B1
4610	B1
4611	B1
4612	B1
4613	C1
4614	B2
4615	C2
4616	B2
4617	C1
4618	B6
4619	B6
4620	C5
6015	A7
6016	A7
6112	B8
6114	B8
6263	B6
6264	B6
6265	B6
7001	A8
7002	A7
7003	A8
7004	A8
7101	B7
7113	B7
7114	B7
7115	C8
7117	C7
7118	B7
7204	B5
7214	C7
7215	B7
7216	B6
7217	C6
7220	A6
7260	B6
7277	A5
7278	A6
7279	A6
7305	A3
7306	A3
7308	A3
7312	A5
7314	A6
7316	A3
7402	D7
7420	B7
7482	C5
7542	C5
7588	C3
7603	C3
7608	B1
7610	B1
7650	B1
7651	C1
7681	C2
7682	C2
T481	C4
T482	C4

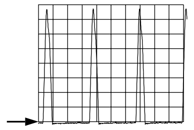
7 Diagrams and print lay-outs


1 2 3 4 5 6 7 8 9 10 11
A B C D E F G H
A2 LINE-DRIVE
VBATT
IM40
for ITV purpose
2450 47u
9453
3453 3R3
9451 RES
5451 27u
2451 22n
3451 22R
HORIZONTAL DEFLECTION COIL
M5
3458 1K
2459 680p
5457 L.LIN
5445 1372.0017A
EHT
FOCUS
G2
TO B CRT PANEL
2458 10u
6466 BYD33J
6465 BYD33J
3454 33K
2457
9460
2475
5465 CU15
5463 CU15
9462
9463
2464 2u2
9464
L1
L2
7460 BU1508DX
138V
0V1
0V
2463
6460 BY228/20
2465
6461 BYW95C/20
2466
2467
2468
9461 RES
3462 6K8
3463 47R
5460 U10
5461 CU15
2456 47n
2462 47n
3461 4K7
2461 1n
L3
HDRIVE A3-42
0V4
34V1
7461 BF819
2460 6n8
ONLY FOR SETS WITH E/W CORRECTION
+11V_LOT
3479 330R
3470
3471
2471
6470 BZX79-C9V1
2470 470p
3472
3473 1K
7470 MTP3055EFI
3V5
0V1
14V8
5470
5471
2472 2u2
6471 RES
6473 RES
EW_PROT
L5
6472 1N4148
3474 4R7
3475 4R7
3476 RES
3477 100R
2473 47u
L4
EWDRIVE A3-43
3484 10K
7481 BC557B
3483 6K8
6481 1N4148
6480 BZX79-C39
2481 470n
BEAMCUR_PROT
3478 100K
EHT_INFO
3482 68K
3481
3480 27K
2480 100n
L6
EHT_INFO A4-37 A2-1
2490 470p
6486 BYV27-200
3486 1R
3487 1R
L7
+11V_LOT
2486 470u
6488 BYD33D
3490 3R3
7480 BC337-25
7V1
4V9
5V6
2488 470u
3489 150R
3493 10R
6489 BZX79-C5V6
2484 100n
L8
+5V_LOT
5480
HEATER A2-2
+8V
7482 BC857B
6463 1N4148
3465 10R
3495 15K
9V4
8V1
3466 RES
6464 RES
6467 RES
XRAY_PROT A3-41
2469 1u
3496 10K
3467 RES
3497 10K
2491 470p
6490 BYV27-400
3491 1R
3492 1R
L9
-11V_LOT
2489 470u
2448 220p
3448 8K2
3449 3K3
6449 1N4148
6450 1N4148
HFB A5-21
6485 BYD33D
3485 4R7
L10
+200V
2485 4u7
29" ONLY
6487 BYD33D
9487
5487 22
3488 1R
2487 220u
L11
+48V_LOT
M60
EHT_INFO A2-1
PROT +200V
GND
HEATER A2-2
7480 A5-12
TO B CRT PANEL C60
CL 86532018_013.AI
010498

DIVERSITY TABLE FOR ALL ITEM NO. MARKED WITH *			
ITEM	PHILIPS TUBE 25"(W E/W)	PHILIPS TUBE 29" W/O E/W	PHILIPS TUBE 29" W E/W
2457	390n	390n	360n
2463	1n	560p	820p
2464	---	---	2u2
2465	8n2	9n1	9n1
2466	10n	---	---
2467	---	---	22n
2468	18n	---	33n
2470	470p	---	470p
2471	470n	---	---
2472	2u2	---	2u2
2473	47u	---	47u
2475	560n	---	---
2487	---	220u	220u
3453	---	4R7	---
3470	33K	---	220K
3471	220K	---	---
3472	100K	---	82K
3473	1K	---	1K
3474	10R	---	4R7
3475	10R	---	4R7
3477	100R	---	100R
3479	330R	---	330R
3481	82K	43K	43K
3488	---	4R7	4R7
5445	312813820571	312813820601	312813820581
5451	33uH	27uH	27uH
5457	822800129531	312813851703	312813851703
5463	---	---	312813834021
5465	312813834011	---	---
5470	311233830531	---	---
5471	---	---	1mH
5480	39uH	47uH	47uH
6461	BYW95C/20	---	BYW95C/20
6470	BZX79-C9V1	---	BZX79-C9V1
6472	1N4148	---	1N4148
6487	---	BYD33D	BYD33D
7470	MTP3055	---	MTP3055
9453	YES	---	YES
9460	---	YES	YES
9461	---	YES	---
9462	YES	---	---
9463	---	---	YES
9464	YES	---	---

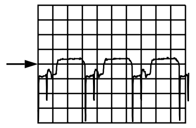
M5	**B5**
M60	**G11**
2448	**E7**
2450	**B4**
2451	**B5**
2456	**F1**
2457	**D6**
2458	**D6**
2459	**C5**
2460	**G1**
2461	**F1**
2462	**F1**
2463	**F4**
2464	**F5**
2465	**E4**
2466	**F4**
2467	**F4**
2468	**F5**
2469	**D8**
2470	**G3**
2471	**G4**
2472	**G4**
2473	**G5**
2475	**E5**
2480	**B9**
2481	**G7**
2484	**C9**
2485	**F9**
2486	**B9**
2487	**F9**
2488	**C8**
2489	**E8**
2490	**B7**
2491	**D7**
3448	**E7**
3449	**E8**
3451	**B6**
3453	**B5**
3454	**D5**
3458	**C5**
3461	**F1**
3462	**E2**
3463	**F3**
3465	**D8**
3466	**D9**
3467	**D9**
3470	**G3**
3471	**G3**
3472	**G3**
3473	**G3**
3474	**H4**
3475	**H4**
3476	**H4**
3477	**G5**
3478	**G7**
3479	**G3**
3480	**B8**
3481	**A8**
3482	**A9**
3483	**G6**
3484	**G6**
3485	**F8**
3486	**B8**
3487	**B8**
3488	**F8**
3489	**C8**
3490	**C8**
3491	**D8**
3492	**E8**
3493	**C9**
3495	**D8**
3496	**D8**
3497	**D9**
5445	**B6**
5451	**B6**
5457	**C6**
5460	**F2**
5461	**F2**
5463	**E6**
5465	**E6**
5470	**F4**
5471	**G4**
5480	**C8**
5487	**F8**
6449	**E9**
6450	**E9**
6460	**E4**
6461	**F4**
6463	**D7**
6464	**D9**
6465	**D5**
6466	**D5**
6467	**D10**
6470	**G3**
6471	**G4**
6472	**G5**
6473	**G5**
6480	**G7**
6481	**G6**
6485	**F7**
6486	**B7**
6487	**F8**
6488	**C7**
6489	**C9**
6490	**E7**
7460	**E3**
7461	**G2**
7470	**G3**
7480	**C9**
7481	**G6**
7482	**D8**
9451	**A6**
9453	**B5**
9460	**E5**
9461	**F5**
9462	**E5**
9463	**F5**
9464	**F6**
9487	**F8**
IM40	**B4**

L1



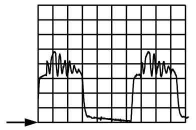
100V / div DC
20µs / div

L2



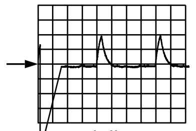
2V / div DC
20µs / div

L3



200mV / div DC
10µs / div

L6

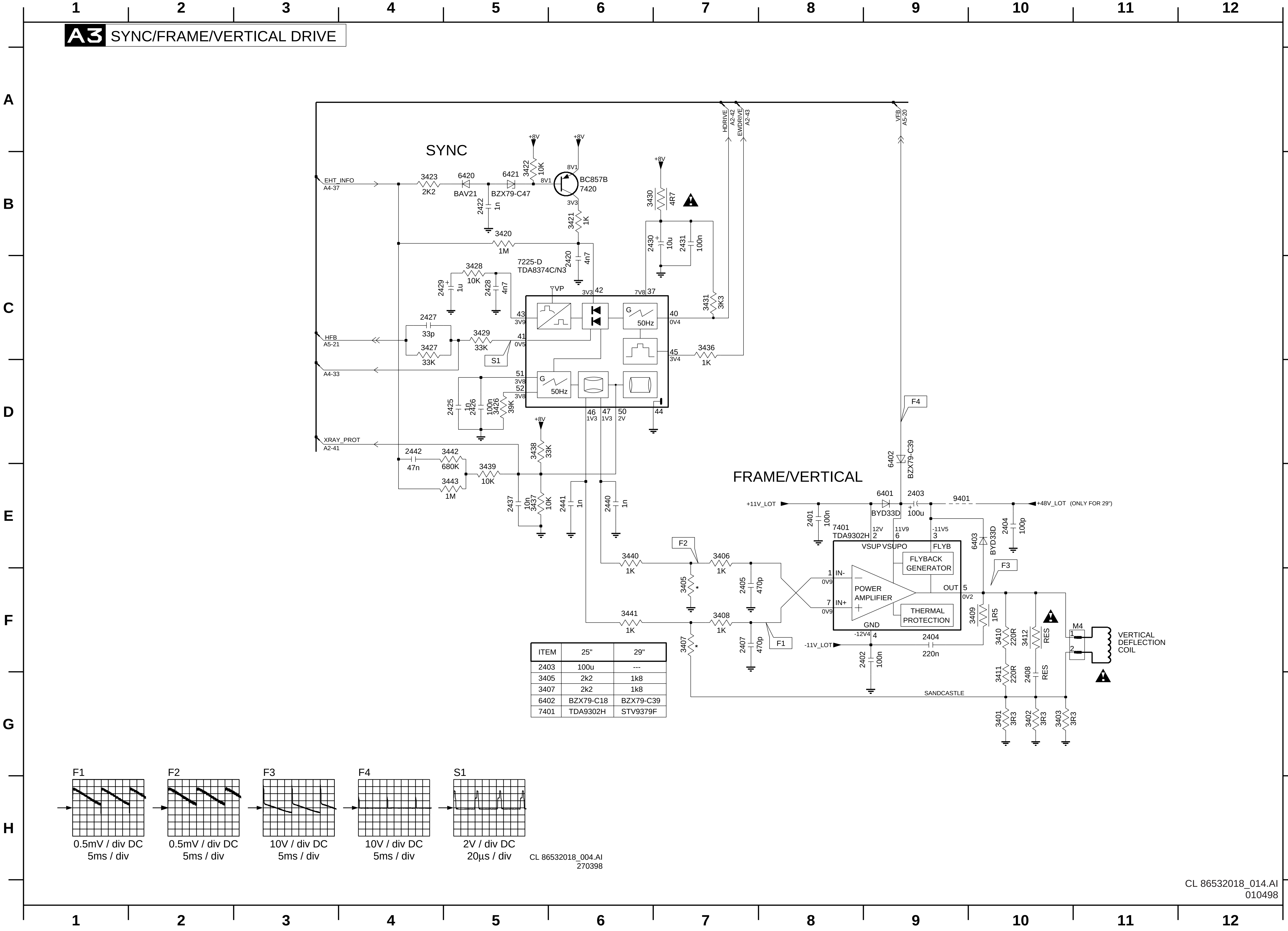


5V / div DC
5ms / div

L8 5.0V DC

L9 -11.7V DC

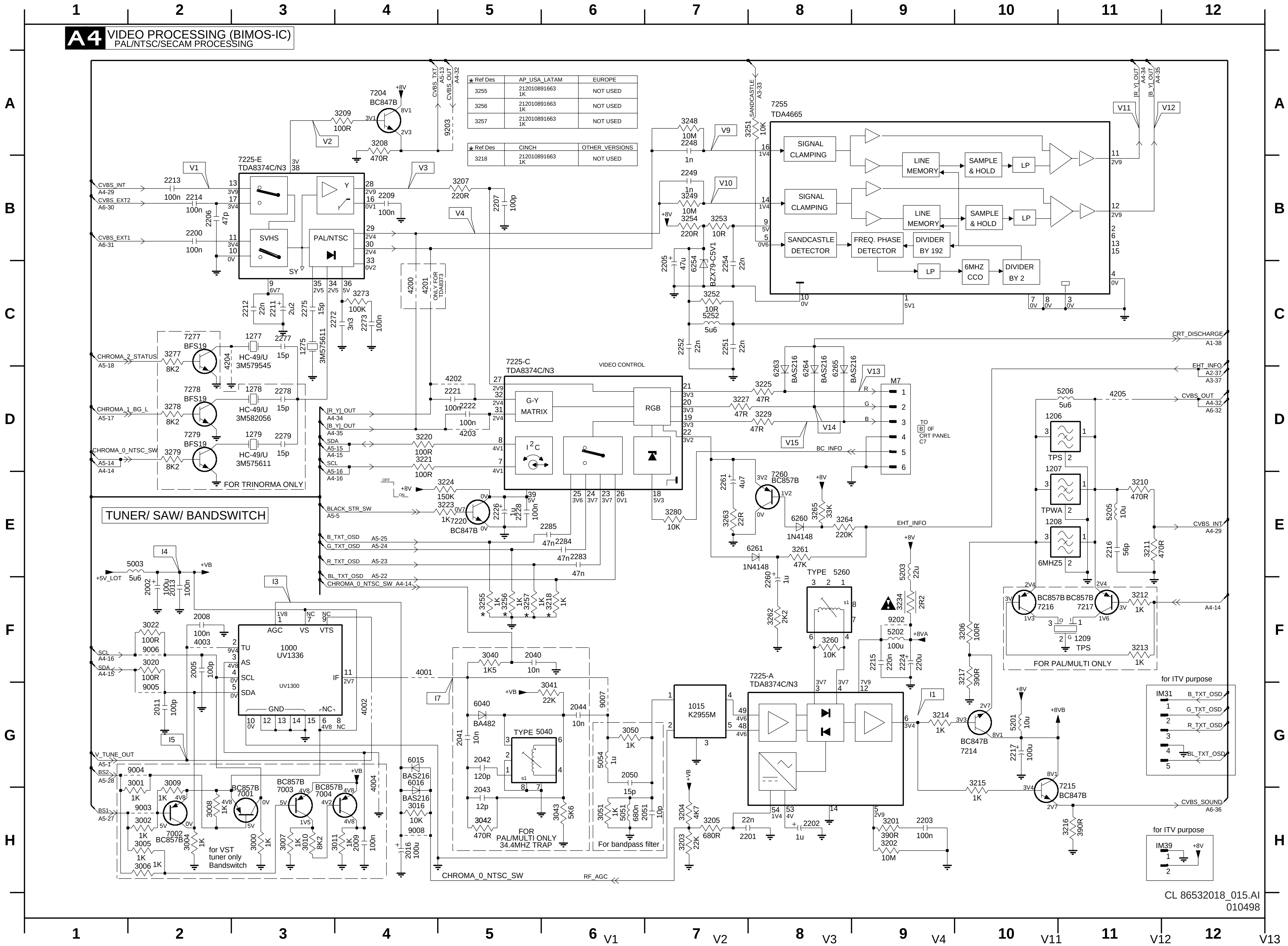
A3 SYNC/FRAME/VERTICAL DRIVE


1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
SYNC
FRAME/VERTICAL
EHT_INFO
A4-37
HFB
A5-21
A4-33
XRAY_PROT
A2-41
HDRIVE
A2-42
EWDRIVE
A2-43
VFB
A5-20
+8V
3423
2K2
6420
BAV21
6421
BZX79-C47
3422
10K
8V1
BC857B
7420
3V3
2422
1n
3421
1K
3420
1M
2420
4n7
7225-D
TDA8374C/N3
3428
10K
2429
1u
2428
4n7
VP
3V3
42
7V8
37
43
3V9
41
0V5
S1
2427
33p
3429
33K
3427
33K
40
0V4
45
3V4
3436
1K
51
3V8
52
G
50Hz
2425
1n
2426
100n
3426
39K
46
1V3
47
1V3
50
2V
44
3430
4R7
2430
10u
2431
100n
3431
3K3
2442
47n
3442
680K
3439
10K
3443
1M
3438
33K
2437
10n
3437
10K
2441
1n
2440
1n
F4
6402
BZX79-C39
+11V_LOT
6401
BYD33D
2403
100u
9401
+48V_LOT (ONLY FOR 29")
2401
100n
7401
TDA9302H
12V
2
11V9
6
-11V5
3
6403
BYD33D
2404
100p
VSUP
VSUPO
FLYB
FLYBACK GENERATOR
F2
3440
1K
3406
1K
3405
2405
470p
1
IN-
0V9
7
IN+
POWER AMPLIFIER
OUT
5
0V2
THERMAL PROTECTION
GND
-12V4
4
F3
3409
1R5
3441
1K
3408
1K
3407
2407
470p
F1
-11V_LOT
2402
100n
2404
220n
3410
220R
3412
RES
3411
220R
2408
RES
M4
VERTICAL DEFLECTION COIL
SANDCASTLE
3401
3R3
3402
3R3
3403
3R3
F1
F2
F3
F4
S1
0.5mV / div DC
5ms / div
0.5mV / div DC
5ms / div
10V / div DC
5ms / div
10V / div DC
5ms / div
2V / div DC
20µs / div
CL 86532018_004.AI
270398

ITEM	25"	29"
2403	100u	---
3405	2k2	1k8
3407	2k2	1k8
6402	BZX79-C18	BZX79-C39
7401	TDA9302H	STV9379F

CL 86532018_014.AI
010498

M4	F11
2401	E8
2402	F9
2403	E9
2404	E10
2404	F9
2405	F7
2407	F7
2408	G10
2420	C6
2422	B5
2425	D5
2426	D5
2427	C4
2428	C5
2429	C4
2430	B6
2431	B7
2437	E5
2440	E6
2441	E6
2442	D4
3401	G10
3402	G10
3403	G10
3405	F7
3406	E7
3407	F7
3408	F7
3409	F10
3410	F10
3411	G10
3412	F10
3420	B5
3421	B6
3422	B5
3423	B4
3426	D5
3427	C4
3428	C5
3429	C5
3430	B6
3431	C7
3436	C7
3437	E5
3438	D5
3439	E5
3440	E6
3441	F6
3442	D5
3443	E5
6401	E9
6402	D9
6403	E10
6420	B5
6421	B5
7225-D	C5
7401	E8
7420	B6
9401	E9

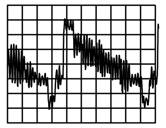

A4 VIDEO PROCESSING (BIMOS-IC)
PAL/NTSC/SECAM PROCESSING
7225-E TDA8374C/N3
SVHS
PAL/NTSC
SY
7204 BC847B
7255 TDA4665
SIGNAL CLAMPING
LINE MEMORY
SAMPLE & HOLD
LP
SANDCASTLE DETECTOR
FREQ. PHASE DETECTOR
DIVIDER BY 192
6MHZ CCO
DIVIDER BY 2
SANDCASTLE A3-33
CVBS_TXT A5-13
CVBS_OUT A4-32
[R_Y]_OUT A4-34
[B_Y]_OUT A4-35
CVBS_INT A4-29
CVBS_EXT2 A6-30
CVBS_EXT1 A6-31
CHROMA_2_STATUS A5-18
CHROMA_1_BG_L A5-17
CHROMA_0_NTSC_SW A5-14 A4-14
7277 BFS19
7278 BFS19
7279 BFS19
HC-49/U 3M579545
HC-49/U 3M582056
HC-49/U 3M575611
FOR TRINORMA ONLY
7225-C TDA8374C/N3
VIDEO CONTROL
G-Y MATRIX
RGB
I²C
SDA A5-15 A4-15
SCL A5-16 A4-16
BLACK_STR_SW A5-5
B_TXT_OSD A5-25
G_TXT_OSD A5-24
R_TXT_OSD A5-23
BL_TXT_OSD A5-22
CHROMA_0_NTSC_SW A4-14
7220 BC847B
7260 BC857B
M7
TO CRT PANEL C7
BC_INFO
EHT_INFO
CRT_DISCHARGE A1-38
EHT_INFO A2-37 A3-37
CVBS_OUT A4-32 A6-32
TYPE 5260
TPS
TPWA
6MHZ5
FOR PAL/MULTI ONLY
7216 BC857B
7217 BC857B
1209 TPS
A4-14
TUNER/ SAW/ BANDSWITCH
1000 UV1336
AGC VS VTS
TU AS SCL SDA IF GND NC
+5V_LOT
V_TUNE_OUT
A5-1
BS2 A5-28
BS1 A5-27
7001 BC857B
7002 BC857B
7003 BC857B
7004 BC857B
for VST tuner only Bandswitch
BA482
BAS216
TYPE 5040
FOR PAL/MULTI ONLY 34.4MHZ TRAP
For bandpass filter
1015 K2955M
7225-A TDA8374C/N3
7214 BC847B
7215 BC847B
CVBS_SOUND A6-36
for ITV purpose
IM31
B_TXT_OSD
G_TXT_OSD
R_TXT_OSD
BL_TXT_OSD
IM39
CHROMA_0_NTSC_SW
RF_AGC
V1 V2 V3 V4 V9 V10 V11 V12 V13 V14 V15
I1 I3 I4 I5 I7
CL 86532018_015.AI
010498

* Ref Des	AP_USA_LATAM	EUROPE
3255	212010891663 1K	NOT USED
3256	212010891663 1K	NOT USED
3257	212010891663 1K	NOT USED

* Ref Des	CINCH	OTHER_VERSIONS
3218	212010891663 1K	NOT USED

M7	D9
1000	F3
1015	G7
1206	D10
1207	D10
1208	E10
1209	F11
1275	C3
1277	C3
1278	D3
1279	D3
2002	F2
2005	F2
2008	F2
2009	H4
2011	G2
2013	F2
2016	H4
2040	F5
2041	G5
2042	G5
2043	H5
2044	G6
2050	G6
2051	H7
2200	B2
2201	H7
2202	H8
2203	H9
2205	C7
2206	B2
2207	B5
2209	B4
2211	C3
2212	C3
2213	B2
2214	B2
2215	F9
2216	E11
2217	G10
2221	D5
2222	D5
2224	F9
2226	E5
2228	E5
2248	A7
2249	B7
2251	C7
2252	C7
2254	C7
2260	F8
2261	E7
2272	C4
2273	C4
2275	C3
2277	C3
2278	D3
2279	D3
2283	E6
2284	E6
2285	E6
3000	H3
3001	G2
3002	H2
3004	H2
3005	H2
3006	H2
3007	H3
3008	H2
3009	G2
3010	H3
3011	H4
3016	H4
3020	F2
3022	F2
3040	F5
3041	G6
3042	H5
3043	H6
3050	G6
3051	H6
3201	H9
3202	H9
3203	H7
3204	H7
3205	H7
3206	F10
3207	B5
3208	A4
3209	A4
3210	E11
3211	E11
3212	F11
3213	F11
3214	G9
3215	G10
3216	H11
3217	F10
3218	F6
3220	D4
3221	D4
3223	E5
3224	E5
3225	D8
3227	D7
3229	D8
3234	F9
3248	A7
3249	B7
3251	A8
3252	C7
3253	B7
3254	B7
3255	F5
3256	F5
3257	F5
3260	F8
3261	E8
3262	F8
3263	E7
3264	E8
3265	E8
3273	C4
3277	C2
3278	D2
3279	D2
3280	E7
4001	F4
4002	G4
4003	F2
4004	G4
4200	C4
4201	C4
4202	D5
4203	D5
4204	C2
4205	D11
5003	E2
5040	G6
5051	H6
5054	G6
5201	G10
5202	F9
5203	E9
5205	E11
5206	D11
5252	C7
5260	E8
6015	G4
6016	G4
6040	G5
6254	C7
6260	E8
6261	E8
6263	D8
6264	D8
6265	D8
7001	H3
7002	H2
7003	G3
7004	H3
7204	A4
7214	G10
7215	H11
7216	F10
7217	F11
7220	E5
7225-A	F8
7225-C	C5
7225-E	B3
7255	A8
7260	D8
7277	C2
7278	D2
7279	D2
9003	H2
9004	G2
9005	G2
9006	F2
9007	G6
9008	H4
9202	F9
9203	A5
IM31	G11
IM39	H12

I1



500mV / div AC
10µs / div

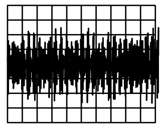
I3 1.6V DC

I3 4.0V DC

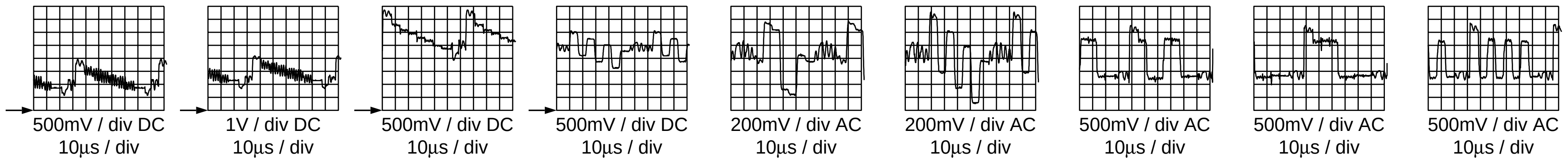
I4 5.0V DC

I5 0.5 - 30V DC

I7

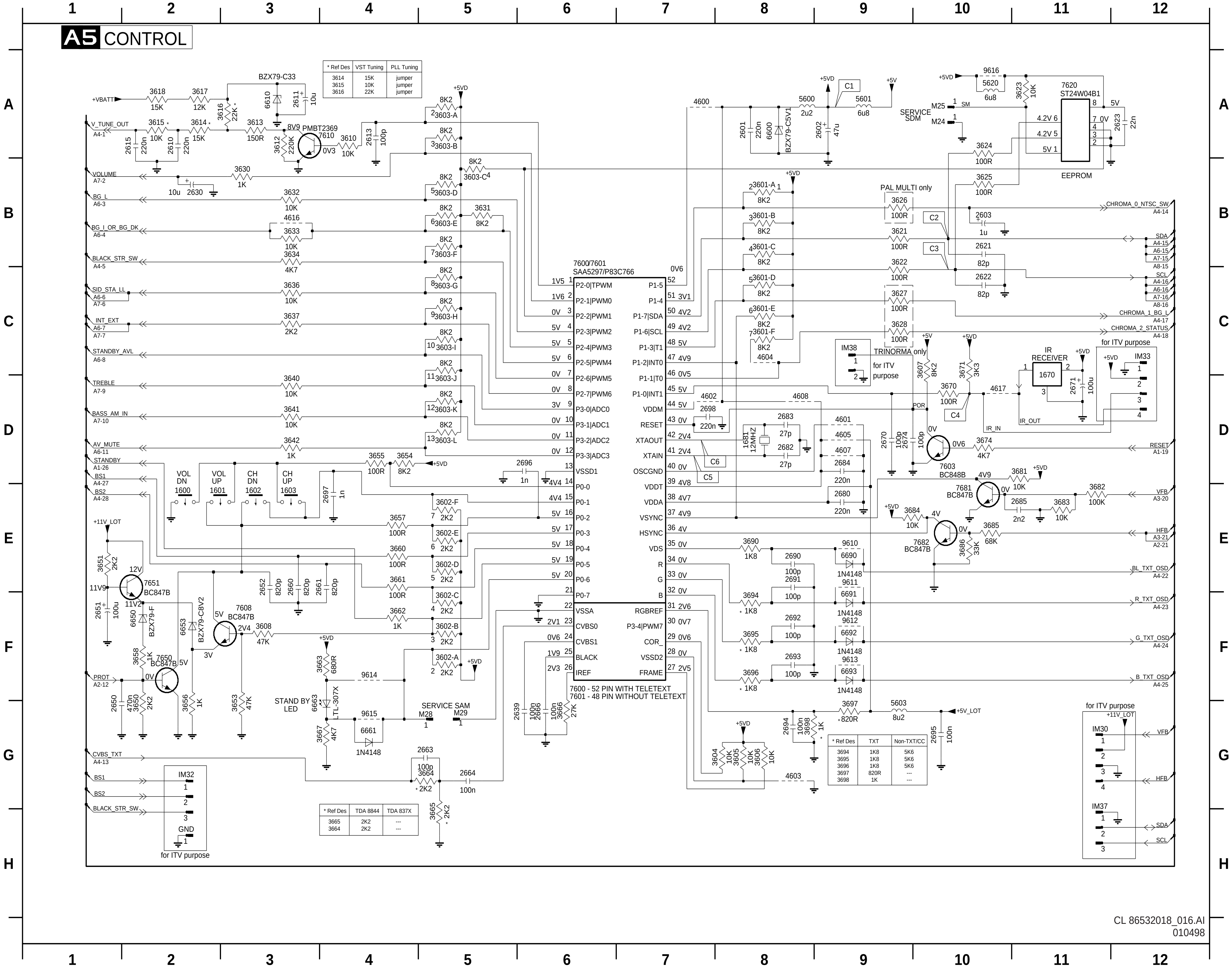


50mV / div AC
500ms / div



V1: 500mV / div DC 10µs / div
V2: 1V / div DC 10µs / div
V3: 500mV / div DC 10µs / div
V4: 500mV / div DC 10µs / div
V11: 200mV / div AC 10µs / div
V12: 200mV / div AC 10µs / div
V13: 500mV / div AC 10µs / div
V14: 500mV / div AC 10µs / div
V15: 500mV / div AC 10µs / div

CL 86532018_005.AI
270398


A5 CONTROL
1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
+VBATT
V_TUNE_OUT
A4-1
VOLUME
A7-2
BG_L
A6-3
BG_I_OR_BG_DK
A6-4
BLACK_STR_SW
A4-5
SID_STA_LL
A6-6
A7-6
INT_EXT
A6-7
A7-7
STANDBY_AVL
A6-8
TREBLE
A7-9
BASS_AM_IN
A7-10
AV_MUTE
A6-11
STANDBY
A1-26
BS1
A4-27
BS2
A4-28
+11V_LOT
PROT
A2-12
CVBS_TXT
A4-13
BS1
BS2
BLACK_STR_SW
IM32
GND
for ITV purpose
BZX79-C33
3618 15K
3617 12K
3616 22K
6610
2611 10u
3615 10K
3614 15K
3613 150R
3612 220K
8V9
PMBT2369
7610
0V3
3610 10K
2613 100p
2615 220n
2610 220n
3630 1K
10u 2630
3632 10K
4616
3633 10K
3634 4K7
3636 10K
3637 2K2
3640 10K
3641 10K
3642 1K
VOL DN 1600
VOL UP 1601
CH DN 1602
CH UP 1603
2697 1n
3655 100R
3654 8K2
3657 100R
3660 100R
3661 100R
3662 1K
2652 820p
2660 820p
2661 820p
3651 2K2
7651 BC847B
12V
11V9
11V2
2651 100u
6650 BZX79-F
6653 BZX79-C8V2
5V
7608 BC847B
2V4
3V
3608 47K
3658 1K
7650 BC847B
0V
2650 470n
3650 2K2
3656 1K
3653 47K
+5VD
3663 680R
9614
STAND BY LED
6663 LTL-307X
9615
6661 1N4148
3667 4K7
SERVICE SAM
M28 1
M29 1
2663 100p
3664 2K2
2664 100n
3665 2K2
8K2 3603-A
8K2 3603-B
8K2 3603-C
8K2 3603-D
8K2 3603-E
3631 8K2
8K2 3603-F
8K2 3603-G
8K2 3603-H
8K2 3603-I
8K2 3603-J
8K2 3603-K
8K2 3603-L
3602-F 2K2
3602-E 2K2
3602-D 2K2
3602-C 2K2
3602-B 2K2
3602-A 2K2
2696 1n
7600/7601
SAA5297/P83C766
P2-0|TPWM
P2-1|PWM0
P2-2|PWM1
P2-3|PWM2
P2-4|PWM3
P2-5|PWM4
P2-6|PWM5
P2-7|PWM6
P3-0|ADC0
P3-1|ADC1
P3-2|ADC2
P3-3|ADC3
VSSD1
P0-0
P0-1
P0-2
P0-3
P0-4
P0-5
P0-6
P0-7
VSSA
CVBS0
CVBS1
BLACK
IREF
P1-5
P1-4
P1-7|SDA
P1-6|SCL
P1-3|T1
P1-2|INT0
P1-1|T0
P1-0|INT1
VDDM
RESET
XTAOUT
XTAIN
OSCGND
VDDT
VDDA
VSYNC
HSYNC
VDS
R
G
B
RGBREF
P3-4|PWM7
COR
VSSD2
FRAME
7600 - 52 PIN WITH TELETEXT
7601 - 48 PIN WITHOUT TELETEXT
2639
2666 100n
3666 27K
4600
2601 220n
6600 BZX79-C5V1
2602 47u
5600 2u2
5601 6u8
C1
SERVICE SDM
M25
M24
9616
5620 6u8
3623 10K
7620 ST24W04B1
EEPROM
2623 22n
3624 100R
3625 100R
3601-A 8K2
3601-B 8K2
3601-C 8K2
3601-D 8K2
3601-E 8K2
3601-F 8K2
4604
PAL MULTI only
3626 100R
3621 100R
3622 100R
3627 100R
3628 100R
C2
C3
2603 1u
2621 82p
2622 82p
CHROMA_0_NTSC_SW
A4-14
SDA
SCL
CHROMA_1_BG_L
A4-17
CHROMA_2_STATUS
A4-18
IM38
TRINORMA only
for ITV purpose
3607 8K2
3671 3K3
IR RECEIVER
1670
2671 100u
IM33
3670 100R
4617
POR
IR_OUT
IR_IN
4602
2698 220n
4608
1681 12MHz
2683 27p
2682 27p
4601
4605
4607
2684 220n
2680 220n
C4
C5
C6
2670 100p
2674 100p
7603 BC848B
0V6
3674 4K7
RESET
A1-19
3681 10K
7681 BC847B
4V9
2685 2n2
3683 10K
3682 100K
VFB
A3-20
3684 10K
4V
7682 BC847B
3685 68K
3686 33K
HFB
A3-21
A2-21
3690 1K8
2690 100p
9610
6690 1N4148
BL_TXT_OSD
A4-22
3694 1K8
2691 100p
9611
6691 1N4148
R_TXT_OSD
A4-23
3695 1K8
2692 100p
9612
6692 1N4148
G_TXT_OSD
A4-24
3696 1K8
2693 100p
9613
6693 1N4148
B_TXT_OSD
A4-25
3697 820R
5603 8u2
+5V_LOT
2694 100n
3698 1K
2695 100n
3604 10K
3605 10K
3606 10K
4603
for ITV purpose
+11V_LOT
IM30
IM37
VFB
HFB
SDA
SCL

* Ref Des	VST Tuning	PLL Tuning
3614	15K	jumper
3615	10K	jumper
3616	22K	jumper

* Ref Des	TDA 8844	TDA 837X
3665	2K2	---
3664	2K2	---

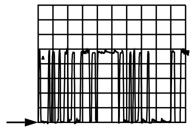
* Ref Des	TXT	Non-TXT/CC
3694	1K8	5K6
3695	1K8	5K6
3696	1K8	5K6
3697	820R	---
3698	1K	---

CL 86532018_016.AI
010498

GND	H2
M24	A10
M25	A10
M28	G5
M29	G5
1600	E2
1601	E2
1602	E3
1603	E3
1670	D11
1681	D8
2601	A8
2602	A9
2603	B10
2610	A2
2611	A3
2613	A4
2615	A2
2621	B10
2622	C10
2623	A12
2630	B2
2639	G6
2650	G1
2651	F1
2652	E3
2660	E3
2661	E4
2663	G5
2664	G5
2666	G6
2670	D9
2671	D11
2674	D9
2680	E9
2682	D8
2683	D8
2684	D9
2685	E11
2690	E8
2691	E8
2692	F8
2693	F8
2694	G8
2695	G10
2696	D6
2697	E4
2698	D7
3601-A	B8
3601-B	B8
3601-C	B8
3601-D	C8
3601-E	C8
3601-F	C8
3602-A	F5
3602-B	F5
3602-C	F5
3602-D	E5
3602-E	E5
3602-F	E5
3603-A	A5
3603-B	A5
3603-C	B5
3603-D	B5
3603-E	B5
3603-F	B5
3603-G	C5
3603-H	C5
3603-I	C5
3603-J	D5
3603-K	D5
3603-L	D5
3604	G8
3605	G8
3606	G8
3607	C10
3608	F3
3610	A4
3612	A3
3613	A3
3614	A2
3615	A2
3616	A3
3617	A2
3618	A2
3621	B9
3622	B9
3623	A11
3624	A10
3625	B10
3626	B9
3627	C9
3628	C9
3630	B3
3631	B5
3632	B3
3633	B3
3634	B3
3636	C3
3637	C3
3640	D3
3641	D3
3642	D3
3650	G2
3651	E1
3653	G3
3654	D4
3655	D4
3656	G2
3657	E4
3658	F2
3660	E4
3661	E4
3662	F4
3663	F4
3664	G5
3665	H5
3666	G6
3667	G4
3670	D10
3671	C10
3674	D10
3681	D11
3682	E11
3683	E11
3684	E9
3685	E10
3686	E10
3690	E8
3694	F8
3695	F8
3696	F8
3697	G9
3698	G8
4600	A7
4601	D9
4602	D7
4603	G8
4604	C8
4605	D9
4607	D9
4608	D8
4616	B3
4617	D10
5600	A8
5601	A9
5603	G9
5620	A10
6600	A8
6610	A3
6650	F2
6653	F2
6661	G4
6663	G3
6690	E9
6691	F9
6692	F9
6693	F9
7600	B6
7603	D10
7608	F3
7610	A4
7620	A11
7650	F2
7651	E2
7681	E10
7682	E10
9610	E9
9611	E9
9612	F9
9613	F9
9614	F4
9615	G4
9616	A10
IM30	G11
IM32	G2
IM33	C12
IM37	G11
IM38	C9

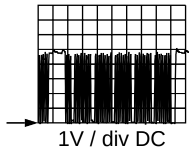
C1 5.0V DC

C2



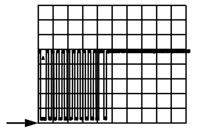
1V / div DC
0.1ms / div

C3



1V / div DC
0.1ms / div

C4

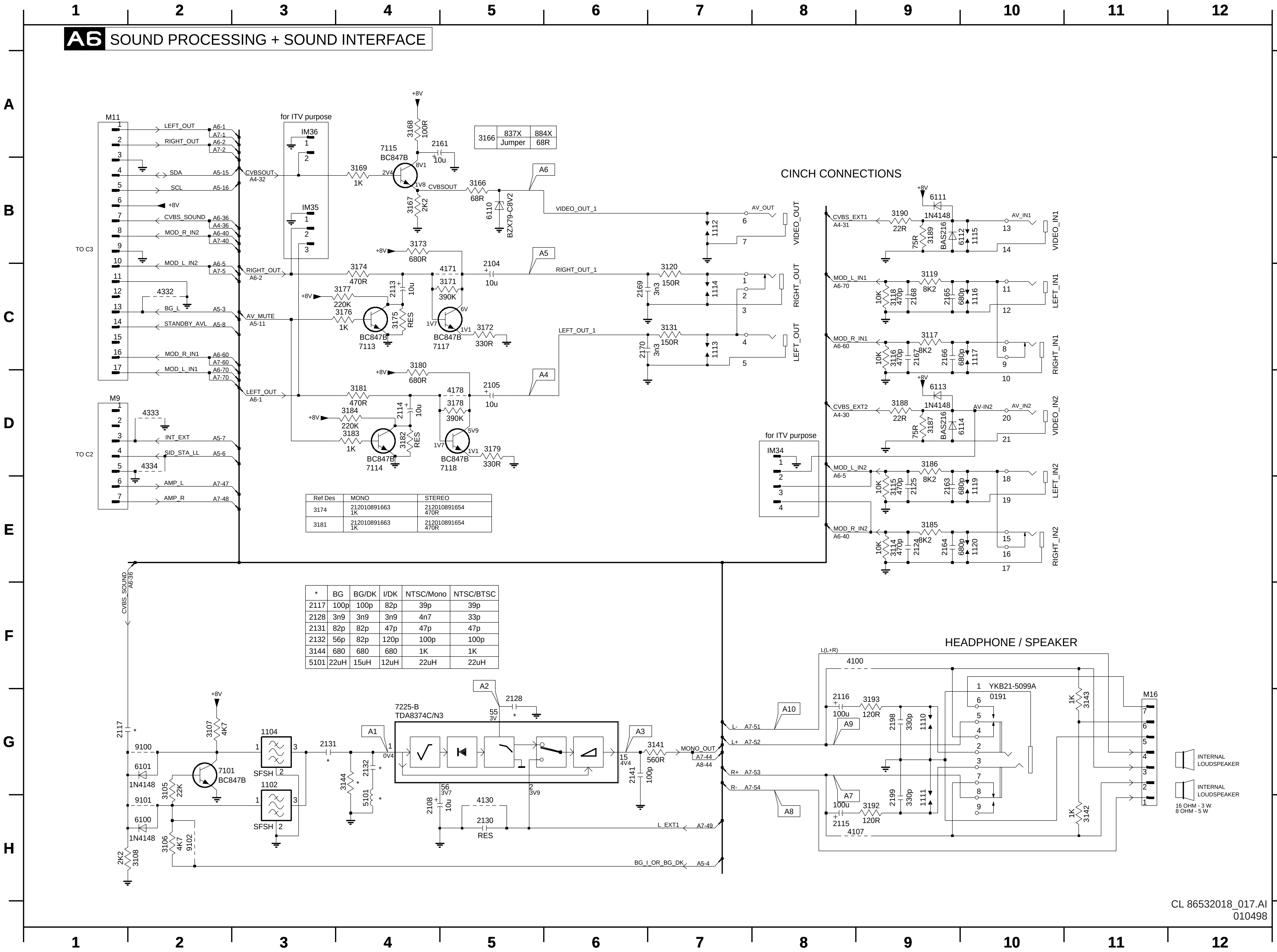


1V/ div DC
5ms / div

C5 3V tt 12 MHz

C6 5V tt 12 MHz

CL 86532018_006.AI
020498


A6 SOUND PROCESSING + SOUND INTERFACE
CINCH CONNECTIONS
HEADPHONE / SPEAKER
for ITV purpose
M11
M9
M16
IM34
IM35
IM36
TO C3
TO C2
LEFT_OUT
RIGHT_OUT
SDA
SCL
+8V
CVBS_SOUND
MOD_R_IN2
MOD_L_IN2
BG_L
STANDBY_AVL
MOD_R_IN1
MOD_L_IN1
INT_EXT
SID_STA_LL
AMP_L
AMP_R
CVBSOUT
AV_MUTE
VIDEO_OUT_1
RIGHT_OUT_1
LEFT_OUT_1
VIDEO_OUT
VIDEO_IN1
LEFT_IN1
RIGHT_IN1
VIDEO_IN2
LEFT_IN2
RIGHT_IN2
CVBS_EXT1
CVBS_EXT2
MONO_OUT
L_EXT1
BG_I_OR_BG_DK
7115 BC847B
7113 BC847B
7117 BC847B
7114 BC847B
7118 BC847B
7101 BC847B
7225-B TDA8374C/N3
6110 BZX79-C8V2
6111 1N4148
6113 1N4148
6112 BAS216
6114 BAS216
6101 1N4148
6100 1N4148
1104 SFSH
1102 SFSH
YKB21-5099A
0191
INTERNAL LOUDSPEAKER
16 OHM - 3 W
8 OHM - 5 W
A1
A2
A3
A4
A5
A6
A7
A8
A9
A10
CL 86532018_017.AI
010498

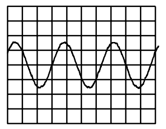
3166	837X	884X
	Jumper	68R

Ref Des	MONO	STEREO
3174	212010891663 1K	212010891654 470R
3181	212010891663 1K	212010891654 470R

*	BG	BG/DK	I/DK	NTSC/Mono	NTSC/BTSC
2117	100p	100p	82p	39p	39p
2128	3n9	3n9	3n9	4n7	33p
2131	82p	82p	47p	47p	47p
2132	56p	82p	120p	100p	100p
3144	680	680	680	1K	1K
5101	22uH	15uH	12uH	22uH	22uH

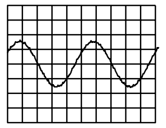
M9	D1
M11	A1
M16	G11
0191	G10
1102	G3
1104	G3
1110	G9
1111	H9
1112	B7
1113	C7
1114	C7
1115	B10
1116	C10
1117	C10
1119	E10
1120	E10
2104	C5
2105	D5
2108	H4
2113	C4
2114	D4
2115	H8
2116	G8
2117	G1
2124	E9
2125	E9
2128	G5
2130	H5
2131	G3
2132	G4
2141	G6
2161	A4
2163	E9
2164	E9
2165	C9
2166	C9
2167	C9
2168	C9
2169	C6
2170	C6
2198	G9
2199	H9
3105	G2
3106	H2
3107	G2
3108	H2
3114	E9
3115	E9
3116	C9
3117	C9
3118	C9
3119	C9
3120	C7
3131	C7
3141	G7
3142	H11
3143	G11
3144	G4
3166	B5
3167	B4
3168	A4
3169	B4
3171	C5
3172	C5
3173	B4
3174	C4
3175	C4
3176	C4
3177	C4
3178	D5
3179	D5
3180	C4
3181	D4
3182	D4
3183	D4
3184	D4
3185	E9
3186	D9
3187	D9
3188	D9
3189	B9
3190	B9
3192	H9
3193	G9
4100	F8
4107	H8
4130	H5
4171	C5
4178	D5
4332	C2
4333	D2
4334	D2
5101	H4
6100	H2
6101	G2
6110	B5
6111	B9
6112	B9
6113	D9
6114	D9
7101	G2
7113	C4
7114	D4
7115	A4
7117	C4
7118	D5
7225-B	G4
9100	G2
9101	H2
9102	H2
IM34	D8
IM35	B3
IM36	A3
M27-A	C8
M27-B	B8
M27-C	C10
M27-D	B10
M27-E	E10
M27-F	D10
M27-G	C8
M27-H	D10
M27-I	E10

A4



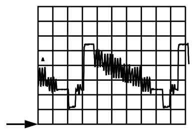
0.5V / div AC
0.1ms / div

A5



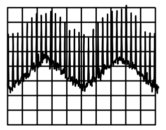
0.5V / div AC
0.2ms / div

A6



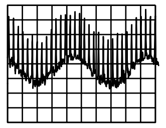
5V / div DC
10ms / div

A7



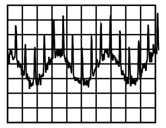
50mV / div AC
0.2ms / div

A8



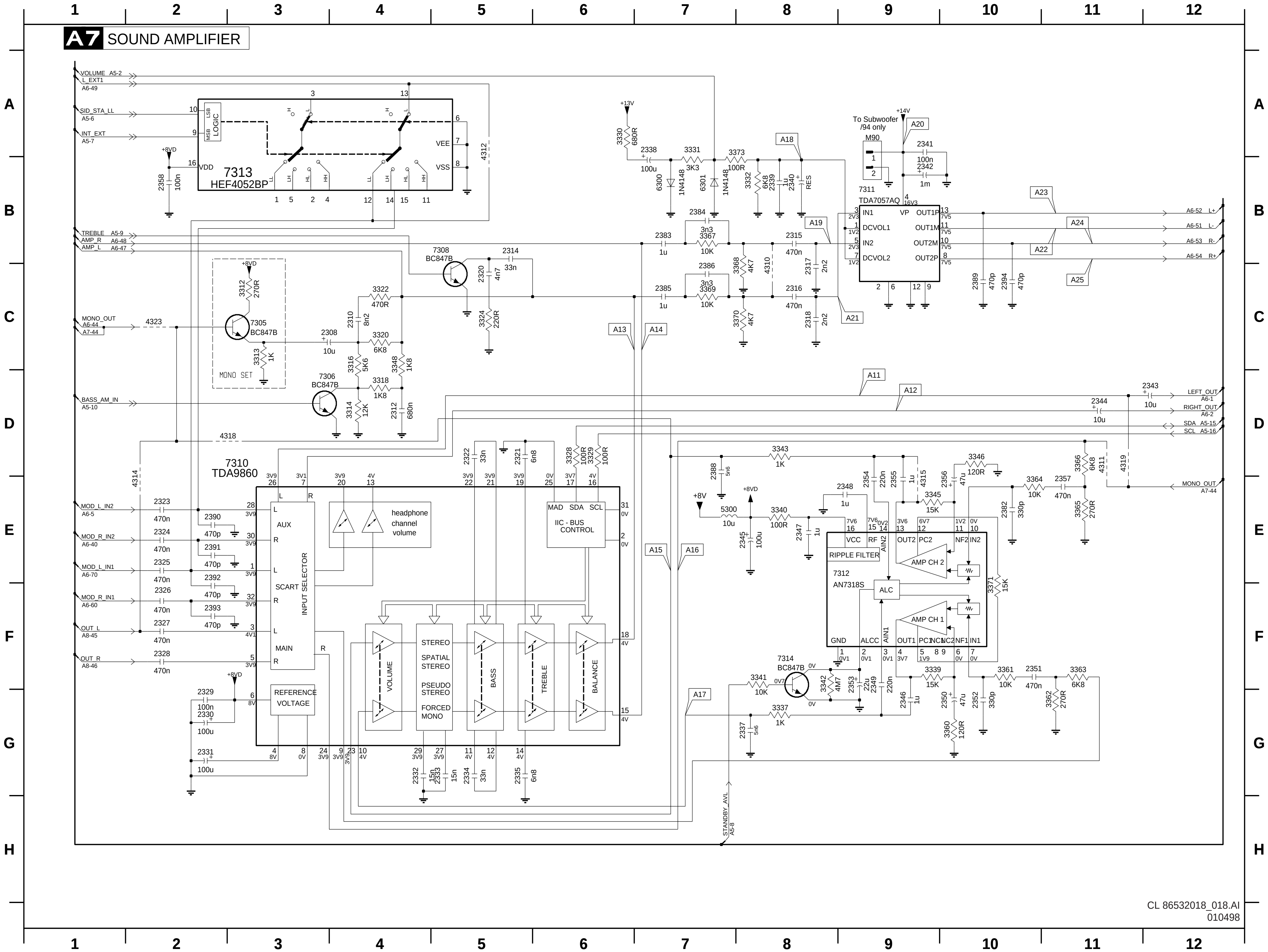
50mV / div AC
0.2ms / div

A9



50mV / div AC
0.1ms / div

CL 86532018_007.AI
020498


A7 SOUND AMPLIFIER
1 2 3 4 5 6 7 8 9 10 11 12
A B C D E F G H
7313
HEF4052BP
LOGIC
VEE
VSS
VDD
7310
TDA9860
AUX
SCART
MAIN
INPUT SELECTOR
headphone channel volume
IIC - BUS CONTROL
MAD SDA SCL
REFERENCE VOLTAGE
VOLUME
STEREO
SPATIAL STEREO
PSEUDO STEREO
FORCED MONO
BASS
TREBLE
BALANCE
7305 BC847B
7306 BC847B
7308 BC847B
7314 BC847B
MONO SET
7311
TDA7057AQ
IN1
IN2
DCVOL1
DCVOL2
VP
OUT1P
OUT1M
OUT2M
OUT2P
To Subwoofer /94 only
M90
7312
AN7318S
RIPPLE FILTER
VCC
RF
ALC
AMP CH 1
AMP CH 2
GND
ALCC
AIN1
AIN2
OUT1
OUT2
NF1
NF2
IN1
IN2
VOLUME A5-2
L_EXT1 A6-49
SID_STA_LL A5-6
INT_EXT A5-7
TREBLE A5-9
AMP_R A6-48
AMP_L A6-47
MONO_OUT A6-44
A7-44
BASS_AM_IN A5-10
MOD_L_IN2 A6-5
MOD_R_IN2 A6-40
MOD_L_IN1 A6-70
MOD_R_IN1 A6-60
OUT_L A8-45
OUT_R A8-46
A6-52 L+
A6-51 L-
A6-53 R-
A6-54 R+
LEFT_OUT A6-1
RIGHT_OUT A6-2
SDA A5-15
SCL A5-16
MONO_OUT A7-44
STANDBY_AVL A5-8
A11 A12 A13 A14 A15 A16 A17 A18 A19 A20 A21 A22 A23 A24 A25
+8VD
+8V
+13V
+14V
1N4148
6300
6301
5300
10u
1u
4312
4314
4318
4323
4310
4311
4315
4319

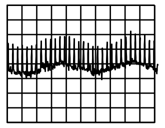
CL 86532018_018.AI
010498

M90	A9
2308	C3
2310	C4
2312	D4
2314	B5
2315	B8
2316	C8
2317	C8
2318	C8
2320	C5
2321	D5
2322	D5
2323	E2
2324	E2
2325	E2
2326	F2
2327	F2
2328	F2
2329	G2
2330	G2
2331	G2
2332	G4
2333	G5
2334	G5
2335	G5
2337	G8
2338	A7
2339	B8
2340	B8
2341	A9
2342	B9
2343	D12
2344	D11
2345	E8
2346	G9
2347	E8
2348	E9
2349	F9
2350	G10
2351	F10
2352	G10
2353	F9
2354	E9
2355	E9
2356	E10
2357	E11
2358	B2
2382	E10
2383	B7
2384	B7
2385	C7
2386	C7
2388	D7
2389	C10
2390	E2
2391	E2
2392	E2
2393	F2
2394	C10
3312	C3
3313	C3
3314	D4
3316	C4
3318	D4
3320	C4
3322	C4
3324	C5
3328	D6
3329	D6
3330	A6
3331	A7
3332	B8
3337	G8
3339	F9
3340	E8
3341	F8
3342	F8
3343	D8
3345	E9
3346	D10
3348	C4
3360	G10
3361	F10
3362	G11
3363	F11
3364	E10
3365	E11
3366	D11
3367	B7
3368	C8
3369	C7
3370	C8
3371	F10
3373	A8
4310	C8
4311	D11
4312	A5
4314	E2
4315	E9
4318	D3
4319	D11
4323	C2
5300	E7
6300	B7
6301	B7
7305	C3
7306	D3
7308	B5
7310	D3
7311	B9
7312	E8
7313	B2
7314	F8

A18 🔊 1.2V DC

A18 🔇 0V DC

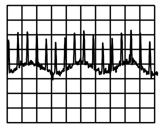
A19



50mV / div AC
0.2ms / div

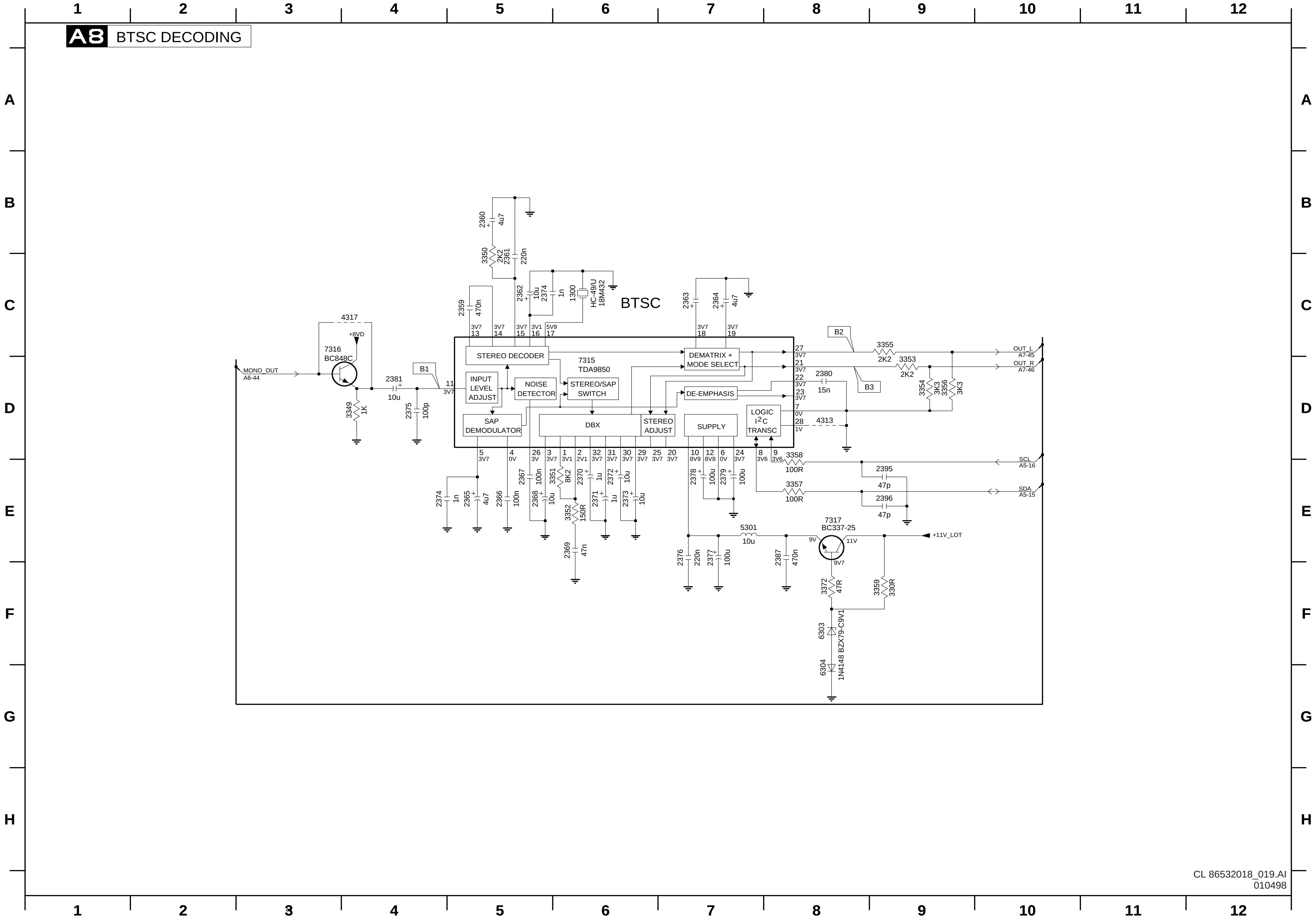
A20 14.8V DC

A21

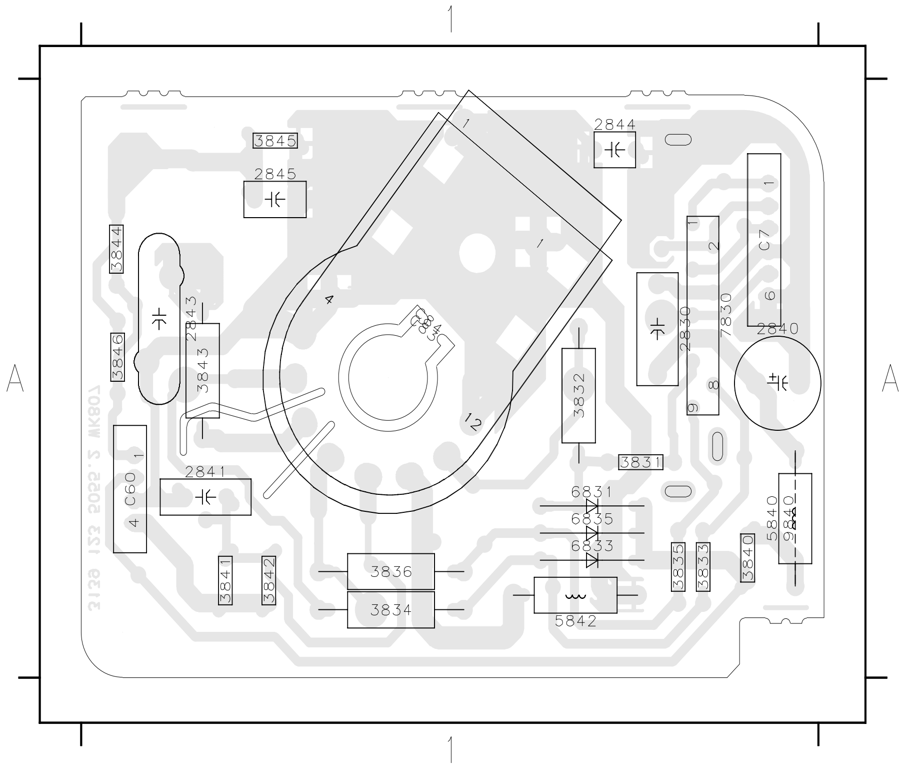


50mV / div AC
0.1ms / div

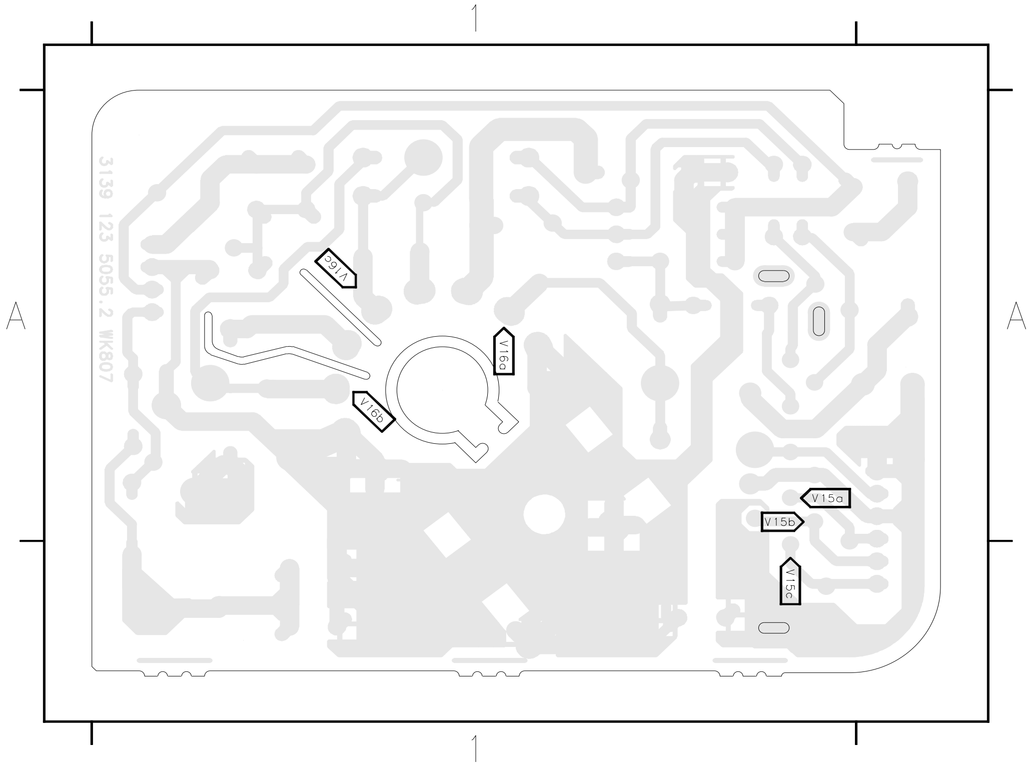
CL 86532018_008.AI
270398

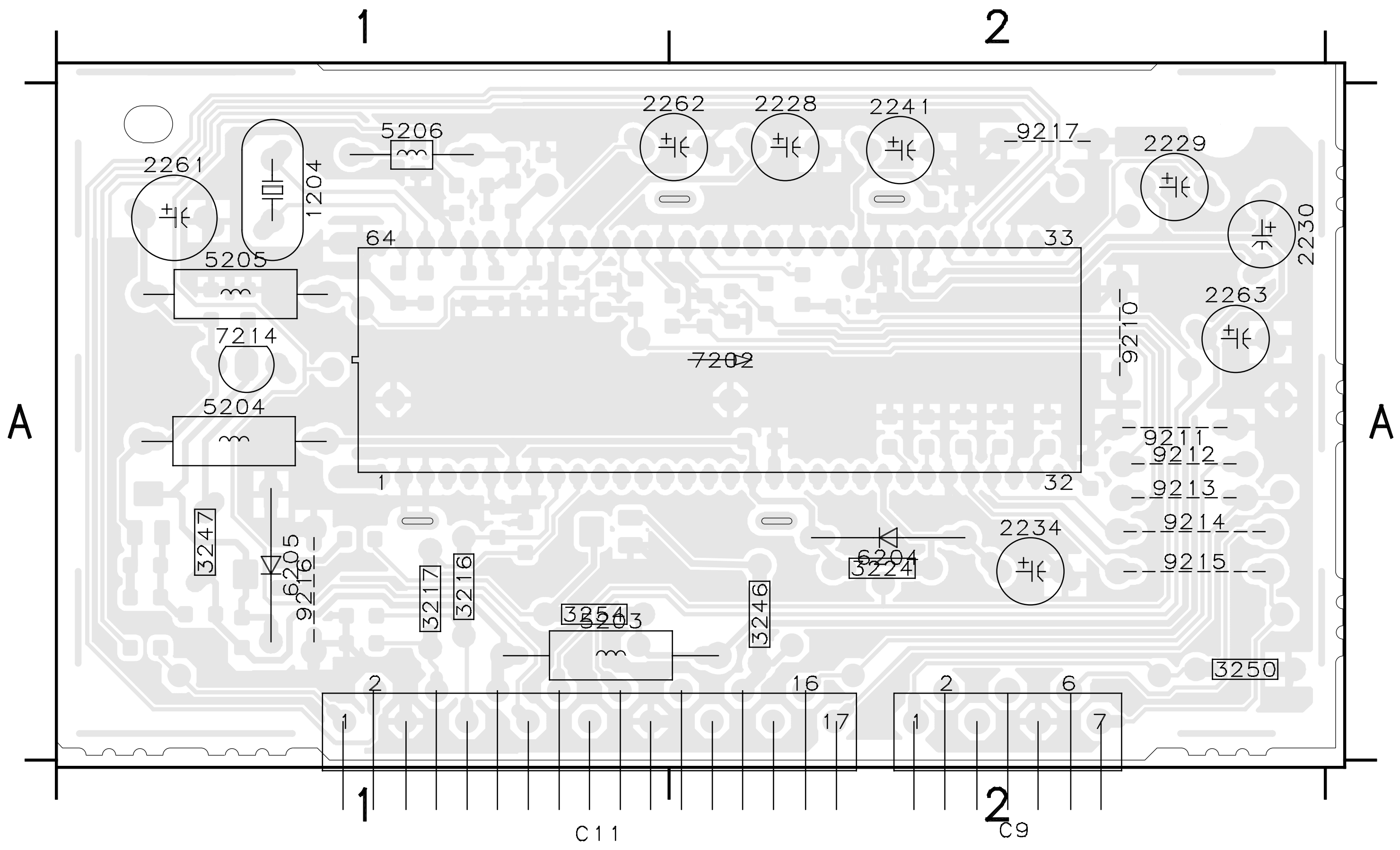

A8 BTSC DECODING
BTSC
7315
TDA9850
STEREO DECODER
INPUT LEVEL ADJUST
NOISE DETECTOR
STEREO/SAP SWITCH
DEMATRIX + MODE SELECT
DE-EMPHASIS
SAP DEMODULATOR
DBX
STEREO ADJUST
SUPPLY
LOGIC I2C TRANSC
7316 BC848C
7317 BC337-25
4317
+8VD
MONO_OUT A6-44
OUT_L A7-45
OUT_R A7-46
SCL A5-16
SDA A5-15
+11V_LOT
B1
B2
B3
1300 HC-49/U 18M432
6303 BZX79-C9V1
6304 1N4148
5301 10u
CL 86532018_019.AI
010498

1300	C6
2359	C5
2360	B5
2361	C5
2362	C5
2363	C7
2364	C7
2365	E5
2366	E5
2367	E5
2368	E5
2369	E6
2370	E6
2371	E6
2372	E6
2373	E6
2374	E4
2374	C5
2375	D4
2376	E7
2377	E7
2378	E7
2379	E7
2380	D8
2381	D4
2387	E8
2395	E9
2396	E9
3349	D4
3350	C5
3351	E6
3352	E6
3353	D9
3354	D9
3355	C9
3356	D9
3357	E8
3358	D8
3359	F9
3372	F8
4313	D8
4317	C4
5301	E7
6303	F8
6304	G8
7315	D6
7316	C3
7317	E8

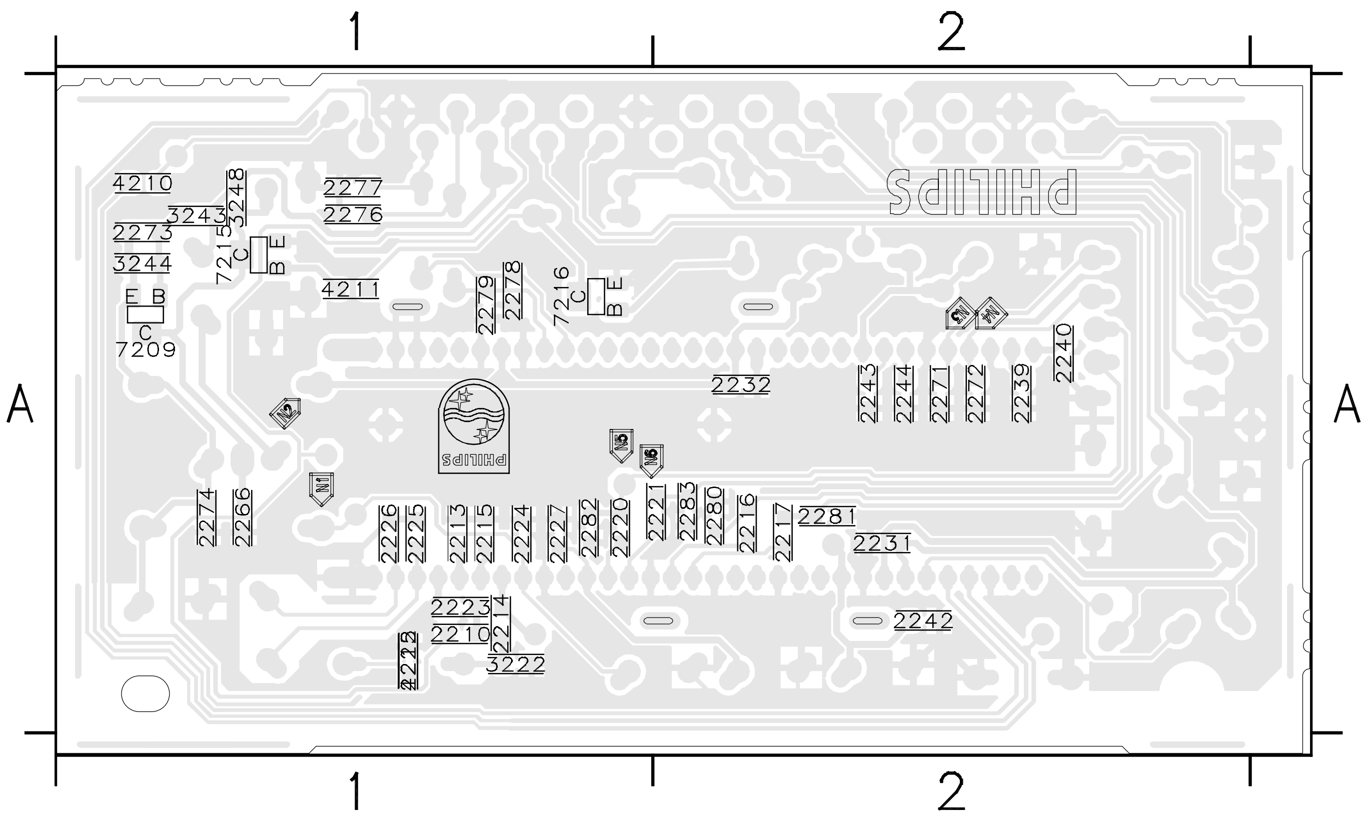

1
A
3845
2845
2844
3844
3846
2843
3843
2841
C60
3841
3842
3836
3834
5842
3832
3831
6831
6835
6833
3835
3833
3840
5840
9840
2830
7830
C7
2840
3120 132 2002.2 WK801

C7	A1
C60	A1
C83	A1
C84	A1
2830	A1
2840	A1
2841	A1
2843	A1
2844	A1
2845	A1
3831	A1
3832	A1
3833	A1
3834	A1
3835	A1
3836	A1
3840	A1
3841	A1
3842	A1
3843	A1
3844	A1
3845	A1
3846	A1
5840	A1
5842	A1
6831	A1
6833	A1
6835	A1
7830	A1
9840	A1

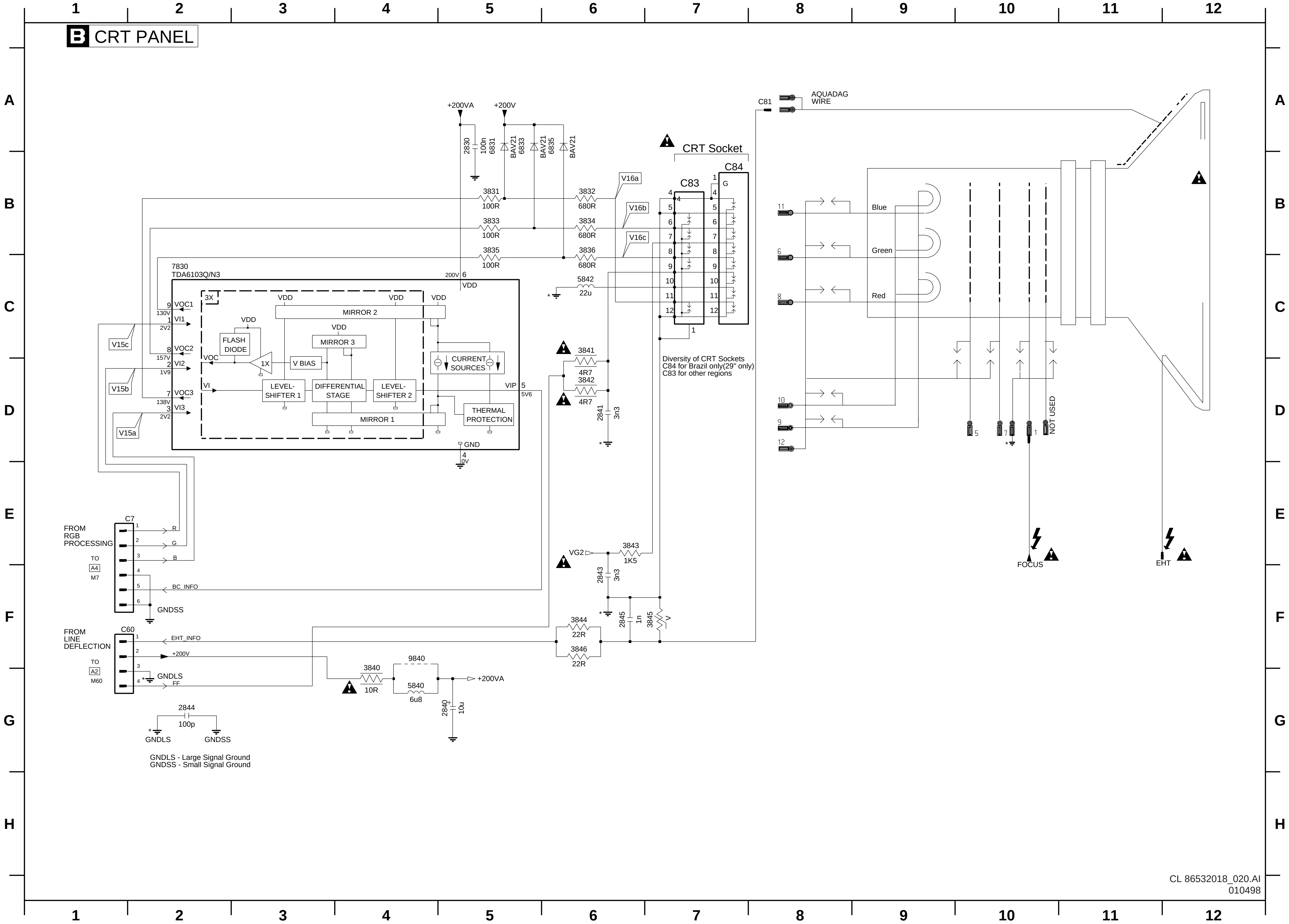

1
A
3139 123 5055.2 WK807
V15a
V15b
V15c
V16a
V16b


1
2
A
2261
1204
5206
2262
2228
2241
9217
2229
2230
2263
5205
7214
5204
7202
64
33
1
32
9210
9211
9212
9213
9214
9215
2234
6204
3224
3247
6205
9216
3217
3216
3254
5203
3246
3250
2
16
17
6
7
C11
C9

C9	A2
C11	A1
1204	A1
2228	A2
2229	A2
2230	A2
2234	A2
2241	A2
2261	A1
2262	A2
2263	A2
3216	A1
3217	A1
3224	A2
3246	A2
3247	A1
3250	A2
3254	A1
5203	A2
5204	A1
5205	A1
5206	A1
6204	A2
6205	A1
7202	A1
7214	A1
9210	A2
9211	A2
9212	A2
9213	A2
9214	A2
9215	A2
9216	A1
9217	A2

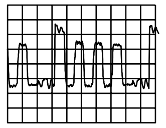

1
2
A
PHILIPS
4210
2277
2276
2273
3243
3248
3244
7215
7209
4211
2279
2278
7216
2232
2243
2244
2271
2272
2239
2240
2274
2266
2226
2225
2213
2215
2224
2227
2282
2220
2221
2283
2280
2216
2217
2281
2231
2223
2214
2210
2222
3222
2242

2210	A1	3222	A1
2213	A1	3243	A1
2214	A1	3244	A1
2215	A1	3248	A1
2216	A2	4210	A1
2217	A2	4211	A1
2220	A1	4215	A1
2221	A2	7209	A1
2222	A1	7215	A1
2223	A1	7216	A1
2224	A1		
2225	A1		
2226	A1		
2227	A1		
2231	A2		
2232	A2		
2239	A2		
2240	A2		
2242	A2		
2243	A2		
2244	A2		
2266	A1		
2271	A2		
2272	A2		
2273	A1		
2274	A1		
2276	A1		
2277	A1		
2278	A1		
2279	A1		
2280	A2		
2281	A2		
2282	A1		
2283	A2		


1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
B CRT PANEL
+200VA
+200V
2830
100n
6831
BAV21
6833
BAV21
6835
BAV21
3831
100R
3833
100R
3835
100R
3832
680R
3834
680R
3836
680R
V16a
V16b
V16c
5842
22u
7830
TDA6103Q/N3
200V 6
VDD
3X
VDD
VDD
VDD
MIRROR 2
VDD
MIRROR 3
VDD
FLASH DIODE
1X
V BIAS
VOC
VI
LEVEL-SHIFTER 1
DIFFERENTIAL STAGE
LEVEL-SHIFTER 2
MIRROR 1
CURRENT SOURCES
THERMAL PROTECTION
VIP 5
5V6
GND
4
0V
9 VOC1
130V
1 VI1
2V2
8 VOC2
157V
2 VI2
1V9
7 VOC3
138V
3 VI3
2V2
V15c
V15b
V15a
CRT Socket
C83
C84
G
4
5
6
7
8
9
10
11
12
1
Diversity of CRT Sockets
C84 for Brazil only(29" only)
C83 for other regions
3841
4R7
3842
4R7
2841
3n3
VG2
3843
1K5
2843
3n3
2845
1n
3845
3844
22R
3846
22R
C81
AQUADAG WIRE
11
6
8
10
9
12
Blue
Green
Red
5
7
1
NOT USED
FOCUS
EHT
FROM RGB PROCESSING
C7
1 R
2 G
3 B
4
5 BC_INFO
6
GNDSS
TO
A4
M7
FROM LINE DEFLECTION
C60
1 EHT_INFO
2 +200V
3
4 FF
GNDLS
TO
A2
M60
3840
10R
9840
5840
6u8
+200VA
2840
10u
2844
100p
GNDLS
GNDSS
GNDLS - Large Signal Ground
GNDSS - Small Signal Ground
CL 86532018_020.AI
010498

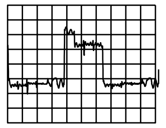
C7	E2
C60	F2
C81	A8
C83	B7
C84	B7
2830	A5
2840	G5
2841	D6
2843	F6
2844	G2
2845	F6
3831	B5
3832	B6
3833	B5
3834	B6
3835	B5
3836	B6
3840	G4
3841	C6
3842	D6
3843	E6
3844	F6
3845	F7
3846	F6
5840	G4
5842	C6
6831	A5
6833	A5
6835	A6
7830	C2
9840	F4

V15a



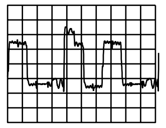
500mV / div AC
10µs / div

V15b



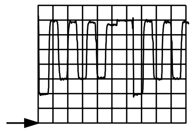
500mV / div AC
10µs / div

V15c



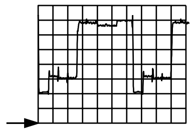
500mV / div AC
10µs / div

V16a



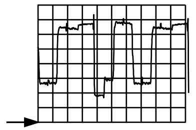
20V / div DC
10µs / div

V16b



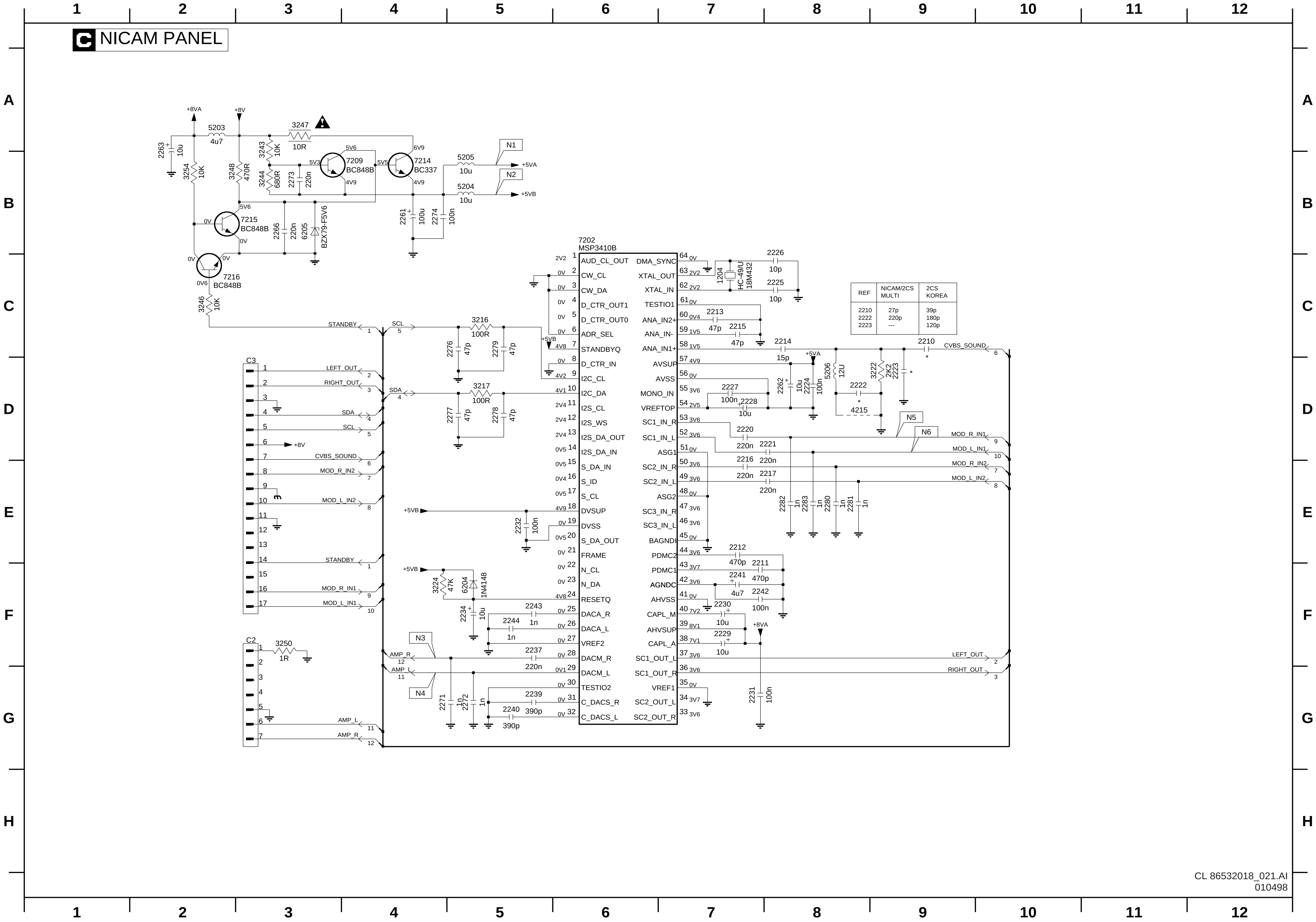
20V / div DC
10µs / div

V16c



20V / div DC
10µs / div

CL 86532018_009.AI
270398


C NICAM PANEL
1 2 3 4 5 6 7 8 9 10 11 12
A B C D E F G H
+8VA
+8V
5203 4u7
3247 10R
2263 10u
3254 10K
3248 470R
3243 10K
3244 680R
2273 220n
7209 BC848B
7214 BC337
5205 10u
5204 10u
N1
N2
+5VA
+5VB
2261 100u
2274 100n
7215 BC848B
2266 220n
6205 BZX79-F5V6
7216 BC848B
3246 10K
7202 MSP3410B
AUD_CL_OUT
CW_CL
CW_DA
D_CTR_OUT1
D_CTR_OUT0
ADR_SEL
STANDBYQ
D_CTR_IN
I2C_CL
I2C_DA
I2S_CL
I2S_WS
I2S_DA_OUT
I2S_DA_IN
S_DA_IN
S_ID
S_CL
DVSUP
DVSS
S_DA_OUT
FRAME
N_CL
N_DA
RESETQ
DACA_R
DACA_L
VREF2
DACM_R
DACM_L
TESTIO2
C_DACS_R
C_DACS_L
DMA_SYNC
XTAL_OUT
XTAL_IN
TESTIO1
ANA_IN2+
ANA_IN-
ANA_IN1+
AVSUP
AVSS
MONO_IN
VREFTOP
SC1_IN_R
SC1_IN_L
ASG1
SC2_IN_R
SC2_IN_L
ASG2
SC3_IN_R
SC3_IN_L
BAGNDI
PDMC2
PDMC1
AGNDC
AHVSS
CAPL_M
AHVSUP
CAPL_A
SC1_OUT_L
SC1_OUT_R
VREF1
SC2_OUT_L
SC2_OUT_R
1204 HC-49/U 18M432
2226 10p
2225 10p
2213 47p
2215 47p
2214 15p
2210
CVBS_SOUND
5206 12U
3222 2K2
2223
2222
4215
2262 10u
2224 100n
2227 100n
2228 10u
N5
N6
2220 220n
2221 220n
2216 220n
2217 220n
MOD_R_IN1
MOD_L_IN1
MOD_R_IN2
MOD_L_IN2
2282 1n
2283 1n
2280 1n
2281 1n
2212 470p
2211 470p
2241 4u7
2242 100n
2230 10u
2229 10u
2231 100n
LEFT_OUT
RIGHT_OUT
3216 100R
3217 100R
2276 47p
2279 47p
2277 47p
2278 47p
STANDBY
SCL
SDA
C3
LEFT_OUT
RIGHT_OUT
CVBS_SOUND
MOD_R_IN2
MOD_L_IN2
MOD_R_IN1
MOD_L_IN1
2232 100n
3224 47K
6204 1N4148
2234 10u
2243 1n
2244 1n
2237 220n
2239 390p
2240 390p
2271 1n
2272 1n
N3
N4
AMP_R
AMP_L
C2
3250 1R
CL 86532018_021.AI
010498

REF	NICAM/2CS MULTI	2CS KOREA
2210	27p	39p
2222	220p	180p
2223	---	120p

C2	F3
C3	D3
1204	C7
2210	C9
2211	F7
2212	E7
2213	C7
2214	C8
2215	C7
2216	E7
2217	E8
2220	D7
2221	D8
2222	D8
2223	D9
2224	D8
2225	C8
2226	C8
2227	D7
2228	D7
2229	F7
2230	F7
2231	G7
2232	E5
2234	F5
2237	F5
2239	G5
2240	G5
2241	F7
2242	F7
2243	F5
2244	F5
2261	B4
2262	D8
2263	A2
2266	B3
2271	G4
2272	G5
2273	B3
2274	B4
2276	C5
2277	D5
2278	D5
2279	C5
2280	E8
2281	E8
2282	E8
2283	E8
3216	C5
3217	D5
3222	D9
3224	F4
3243	A3
3244	B3
3246	C2
3247	A3
3248	B2
3250	F3
3254	B2
4215	D8
5203	A2
5204	B5
5205	B5
5206	D8
6204	F5
6205	B3
7202	B6
7209	B4
7214	B4
7215	B3
7216	C3

N1	4.1V DC
N2	4.2V DC
N3	0.2ms AC

CL 86532018_011.AI
020498

8 Electrical adjustments

Notes :
Unless stated otherwise, the supply voltage used is :

- 220v to 240v +/- 10%, 50 - 60 Hz +/- 5%.
- Voltage and oscillograms are measured in relation to earth.
- Never use a heatsink as earth.

For the adjustments a colour pattern generator PM5418 has been used. Pattern generator type PM5193 (optional) .

8.1 Settings on the carrier panel

8.1.1 + 140 V supply voltage for 25" and 29" picture tubes.

Connect a multimeter (DC) across C2551. Set brightness at mid position and contrast at maximum. Apply a pattern generator with a colour bar. Adjust potentiometer R3572 to 140 Volts +/- 1 V DC.

8.1.2 Geometry adjustments (software adjustment)

Set pattern generator (e.g. PM5418) with colour bar pattern and connect to aerial input with RF signal amplitude - 1mv. Enter SAM mode byusing the Dealer Service Tool or short-circuit service pins M28 and M29 on PCB and switch power "ON". The menu is displayed whenever SAM mode is entered.

Enter into GEOMETRY menu.

- Vertical Amplitude and position
  - Select item VSH and set vertical shift to 31 (Nominal value !!).
  - Select item VAM and align the top of the screen with vertical amplitude.
  - Select item VSL and align the bottom of the screen with vertical slope.

- Horizontal Amplitude and phase
  - Select item HSH and align horizontal shift until picture to center of the screen.
  - Select item EW and align the picture width (only those sets with East-West drive circuit).
  - Select item PW and align East-West parabola for straight vertical lines.
  - Select item TC and align east-west trapezium for a rectangle.
  - Repeat if necessary.

General :

The value can be increment or decrement by pressing the user remote control right or left key. The results of the picture will change according to the selected item.

8.1.3 Focusing

Set pattern generator (e.g. PM5418) with colour bar pattern and connect to aerial input with RF signal amplitude of 1mv. Set brightness and contrast at maximum. Adjusted with focusing potentiometer (upper hole of LOT 5445) for maximum sharpness of the picture.

8.1.4 IF-PLL / RF AGC adjustment (software adjustment)

Set generator (e.g. PM5418) with colour bar pattern and set frequency for PAL to 189.25MHz and for NTSC 55.25MHz with RF signal amplitudeof 3mv (70dBuv) and connect this signal to the aerial input.

Enter SAM mode by Dealer Service Tool or short-circuit service pins M28 and M29 on PCB and switch power ON. The menu is displayed whenever SAM mode is entered. Enter into TUNER menu, select items IF-PLL for AFT alignment

Method Of Alignment

- Set AFW to 80 kHz
- Adjust IF-PLL until AFA & AFB just switching from "0" to "1". The correct value for IF-PLL is 61.

Enter into TUNER menu, select items AGC for RF AGC alignment.

Method Of Alignment

- Connect a multimeter (DC) at pin 1 of tuner.
- Adjust the AGC until the voltage at pin 1 of the tuner is 4Volts +/- 0.4V DC. The correct value for AGC should be 37.

The value can be increment or decrement by pressing the user remote control right or left key.

8.1.5 Picture demodulator adjustment

Connect a pattern generator (e.g. PM5418) with a cross hatch. Connect an oscilloscope (1ms/div) to pin 6 of IC 7225-5A and adjust L5260 so that the overshoot response is minimum . Select a colour bar signal and verify if the picture is OK.

8.1.6 34.4MHz Trap Alignment

NOTE: For Pal multi set only.

GENERAL SET-UP

Connect Frequency Synthesizer PM5193 with sine wave and signal strength of 100mv rms. (100dBuv) via a 50 ohm cable terminated with a RC network(50ohm,10nF) and connect to tuner C-CUT (C-CUT OPEN) . Output detection points at saw filter coil 5040 ,pin 3of 1050. The capacitor is in series with the signal, the resitor is vonnected to ground. Adjust L5040 for minimum amplitude.

8.2 VG2 and White-D settings

8.2.1 Vg2 cut off alignment

Connect a pattern generator (e.g. PM5418) with a black picture , set picture controls of the TV set as following :

Brightness: 25

Colour : 30

Contrast: 50

Switch on the TV set and measure with a 100 : 1 scope probe at the cathodes of the picture tube socket pin 6,8 and 11 of CRT sockets C83/84 ; alternately pin 6 for Green, pin 8 for Red and pin 11 for Blue .

Measure the level of the pluses and adjust the level of the highest pluses by means of the Vg2 potentiometer (lower knob of LOT 5445). The DC level must be 140 Volts +/- 2V DC for 25" tubes and 160Volts +/-2V DC for 29" picture tubes.

8.2.2 White-D adjustment (software adjustment)

Connect a pattern generator (e.g. PM5418) and set it to white raster pattern.

Enter SAM by using the Dealer Service Tool or short-circuit service pins M28 and M29 on PCB and switch power "ON"

The menu will be displayed whenever SAM mode is entered. Enter into WHITE TONE menu and select item NORMAL, DELTAWARM, or DELTACOOL; only one of the three items (R, G or B) will be displayed on the screen. The initial default value setting for NORMAL is 37.The factory settings of the colour temperatures are:

NORMAL	10500K	R = 37	G = 37	B = 37
DELTA COOL	14000K	R = 0	G = 254	B = 249
DELTA WARM	8200K	R = 0	G = 1	B = 3

8.3 Audio adjustments

8.3.1 BTSC Sound adjustment (software adjustment)

Set generator (e.g. PM5418) BLACK(without video) pattern, set audio to stereo mode, carrier "ON" and test data to 1, RF frequency NTSC 187.25MHz with signal amplitude of 1mv and connect this signal to the aerial input.

Enter SAM mode by Dealer Service Tool or short-circuit service pins M28 and M29 on PCB and switch power "ON"

The menu is present whenever SAM mode is entered. Enter into the AUDIO menu and select item according to factory setting. Check the sound quality by the generator setting listed below.

The factory settings for BTSC are :

AUDIO	
AUTO	>
ST-NT	7
SAP-NT	7
LA	7
WIDEB	19
SPECT	19

Abbriviations:

ST-NT -> Stereo Nicam adjustment

SAP-NT -> Second audio program adjustment

LA -> L L' adjustment

WIDEB -> Wideband adjustment

SPECT -> Spectral adjustment

NOTE: ALL VALUES ARE RECOMMENDED NOMINAL VALUES.

8.3.2 2CS/NICAM Sound adjustment (software adjustment)

Set generator (e.g. PM5418) BLACK(without video) pattern, set audio to stereo mode, carrier "ON" , set RF frequency PAL 189.25MHz, NTSC 55.25MHz with signal amplitude - 1mv and connect to aerial input. Enter the SAM mode by using the Dealer Service Tool or short-circuit service pins M28 and M29 on PCB and switch power "ON". The menu is displayed whenever SAM mode is entered.

Enter into AUDIO menu and select item according to factory setting. Check the sound quality by the above generator setting. The factory settings for 2CS/NICAM are :

AUDIO	
A-FM	80
AT	8
STEREO	143
DUAL	113

NOTE: ALL VALUES ARE RECOMMENDED NOMINAL VALUES.

9 Circuit description new circuits

Power supply (diagram A1)

9.1 Introduction

9.1.1 General

The switched mode power supply (SMPS) is mains isolated. The control IC7520 (MC44603AP) gives pulses for driving FET 7518 with duty cycle control at fixed frequency of nominal 40 kHz in normal operation. In stand-by, slow-start and overload situation the SMPS runs at other frequencies than these 40 kHz.

Basic characteristics of SMPS :

- Mains Isolated flyback Converter type
- Input range : 90 - 276 Volts AC (multi voltage) or 150 - 276 Volts AC (single voltage).
- Secondary Sensing by Opto Coupler
- IC7520 is Featured with a Slow-Start circuitry
- Over-and undervoltage Protection Circuit of the secondary supply voltages. In case the load decreases under a certain threshold level the SMPS will switch into stand-by-mode (in stand-by SMPS is in the so called "reduced frequency mode"; this is nominal about 20 kHz).

The (VBATT (+140 Volts for A/P and +130 Volts for LATAM output gives a stabilized (VBATT for 25" and 29" tubes in normal operation and approx. 140 Volts DC for A/P and 130 Volts for LATAM in stand-by mode. IC7541 (=TDA8139) having a stable regulator for +5 Volts and +8 Volts supply and also a built-in protection circuit for +5 Volts and +8 Volts supply is present. If pin 4 is low in the standby mode, the IC disables the supply output voltage of (8Volts, so IC7225 (TDA8374C) line output stage will be shut "down". If no 8 Volts supply is present transistor 7542 will switch on, this will cut off the +VBATT; it also performs a fast CRT discharge. If the power is switched off, pin 6 of IC7541 will be low and the protection circuit starts to shut down the +5 Volts and +8 Volts.

9.1.2 Output voltages

Power output secondary output voltages:

- 14 Volts for the audio amplifier
- 13 Volts for the audio processing
- 5 Volts for the control part (is also available in standby/ reset)
- 8 Volts for the video processing and Nicam
- 140 Volts for A/P and (130 Volts for LATAM for the line output stage and the tuning system

9.1.3 The switching periods of TS7518

The duty cycle of the power supply depends on T-on of FET TS7518 and this is controlled by pin 3 of IC7520. This IC detects the variations of the (VBATT via sensing-winding 8-9 at the primary side of T5545. The switching period of TS7518 can be divided into three main phases: Duty cycle T-on, T-off and T-dead

- During T-on, FET 7518 will switch on and conducts, so the energy that is extracted from the mains is stored into the primary winding 2-5 of transformer T5545 with a linear increasing primary current. The slope depends on the voltage across C2508. Via T-on regulation by pin 3 of IC7520 the duty cycle of the SMPS and so the (VBATT is controlled.
- During T-on FET 7518 will switch off and does not conduct, so all energy "inside" the transformer is supplied to the load via secondary windings of T5545 and the secondary diodes (D6550, D6560 and D6570,D6590). The current through the secondary side of the transformer decreases with a linear slope of T5545.
- During T-dead FET 7518 does not conduct and no energy is extracted from the mains of supplied side, this gives space for T-on and T-off regulation.

9.2 Primary side

9.2.1 Mains input and degaussing

- Mains voltage: this voltage is filtered by L5500 and 5502, rectified by a diode bridge rectifier 6505 and smoothed by C2508 to the DC input voltage for the SMPS at pin 5 of T5545 (e.g. 300V DC for 220V AC mains).
- Multi voltage: Only small adaptations of some component values are needed to achieve this.
- Degaussing : R3504 is a dual PTC (2PTC's in one housing). When switching "on" the set, the PTC is cold and low-ohmic. This would give very high degaussing current. After degaussing the PTC will be heated up and become high-ohmic; during normal operation the degaussing current is very low.

9.2.2 Start up and take over

- Start-up : Via the start-up circuitry 3510, 3530 and 3529 the voltage coming from 220V AC mains is used to start-up IC7520 via the supply pin 1. As long as pin 1 has not reached 14.5 Volts, IC7520 does not start up and only sinks 0.3mA. If Vpin 1 reaches the 14.5 Volts, IC7520 will start (FET 7518 will conduct) and pin 1 sinks a typical supply current of about 17 mA. This supply current cannot be delivered by the start-up circuitry, so a take-over circuit must be present. If no take-over will take place the voltage on pin 1 will decrease and IC7520 will switch off; in that case the restart procedure will start again.
- Take over of IC7520: During start-up a voltage across winding 8 - 9 is built up. At the moment the voltage across winding 8 - 9 reaches approx. (14.5 Volts, D6540 start conducting and takes over the supply voltage Vpin 1 of IC7520 (take over current is approx. 17mA).

Note: This power supply is a SMPS (= Switched Mode Power Supply) and not a SOPS (= Self Oscillating Power Supply).

9.3 Control circuitry; see page 37 for blockdiagram.

9.3.1 IC7520 control mechanisms

IC7520 controls the T-on time of FET 7518 in all three operation modes:

- "Secondary-output-sensing" controls the secondary output voltages via the feedback voltage pin 14.
- "1-prim current sensing" controls both the secondary output voltages and the maximum 1-prim via the current sense voltage pin 7.
- "Demagnetization control" prevents the transformer T5545 from going into saturation via the so called "DEMAG" function at pin 8; this will cause slow-start operation.

9.3.2 Secondary output voltage's feedback (pin 14 of IC7520)

Voltage feedback for T-ON control : Regulation of the SMPS is via pin 14. Winding 2 -5 has the same polarity as winding 16 - 18, so variations of the +VBATT can be sensed and feed-back to pin 14. The control voltage of winding 2 -5 during off period of TS7518 the Opto-coupler 7581 conducted rectified by D6540, smoothed by 2540 and coupled via 7581 and adjustable by 3572. For the information at pin 14 of IC7520 controls each portion of energy transferred to the secondary side such that the output voltages remain nearly independent of load variations.

9.3.3 *I-prim sensing (pin 7 of IC7520)*

The current sense voltage at pin 7 is a measure for the I-prim through FET7518. The I-prim is converted into a voltage by R3518. The current sense voltage at pin 7 is used to control both the secondary output voltages and the maximum Iprim (see peak current limiting).

9.3.4 *Demagnetization control (via pin 8 0f IC7520)*

Winding 8 - 9 has the same polarity as the secondary windings that are supplying the load. As a result the voltage across this winding is negative during T-on, positive during T-off and oscillating during T-dead. The so called demagnetization (block " DEMAG " in IC7520) function at pin 8 of IC7520 is used for blocking the output pin 3 during the time that there is still energy in the transformer (1sec not zero). This is realized by delaying the T-on until the demagnetization is completely finished. In this way the currents and voltages at the moment of switching "on" the FET are controlled.

9.3.5 *IC7520 control*

The error amplifier (block A) compares the feedback voltage at pin 14 with an internal reference voltage of 2V5. The output voltage V error-out of this error amplifier is fed to another comparator (block B). This comparator also compares the V error-out and the current sense voltage at pin 7. When the current sense voltage at pin 7 becomes higher than the output-voltage of the error amplifier V error-out, the comparator B gives a spike (the output of comparator B is the so called current sensing output-voltage Vcs out).

9.3.6 *Flip flop*

Flip flop (in block C) drives the output pin 3 via a buffer amplifier (block D). The flip flop is set by the positive edge of the output of the oscillator, V osc and reset by the spike V cs out. As a result the pulse at pin 3 becomes "high" --> T-on starts and by the positive edge of Vosc from the internal oscillator and "low" --> T-on stops by the spike of Vcs out . The T-on start will be delayed in case the transformer is not yet demagnetized; see the slow-start procedures.

9.3.7 *Stable load and increasing / decreasing load*

In case of a stable load, the feedback voltage at pin 14 and so also the maximum current sense voltage at pin 7 remains the same; as a result the T-on and the duty cycle will remain the same. In case of an increasing load, the secondary output voltage will decrease. The voltage on pin 14 would also like to decrease which causes a V error -out to increase. As a result comparator B will give the pulse later; pin 3 will be "high" for a longer period (longer T-on so the duty cycle increase) and so the secondary output voltages will be increased (corrected). This will give a new balance of feedback voltage at pin 14 and the internal 2V5 reference voltage, at a new and larger duty cycle. As a result of the longer T-on, the maximum I-prim increases, so more energy will be stored in the transformer. In this way more energy will be supplied to the load. In case of a decreasing load, the secondary output voltage increases. The voltage on pin 14 would like to increase which causes V error-out to decrease. As a result comparator B will give the pulse earlier, Vpin 3 will be "high" for a shorter period (shorter T-on so the duty cycle decrease) and so the secondary output voltages will be decreased (corrected). This will give a new balance off feedback voltage Vpin 14 and the internal 2V5 reference voltage, at a new smaller duty cycle. As a result of the shorter T-on, the maximum I-prim decreases, so less energy can be stored in the transformer. In this way less energy will be supplied to the load. In case the demagnetization of the transformer is not yet finished, the positive edge from the oscillator, which will start a new cycle, will be overruled via buffer block D as being the starting point of T-on will be delayed and frequency of the SMPS will go down. This procedure is used during start-up.

9.3.8 *Peak current limiting*

Peak current limiting is realized by an internal clamp at pin 7. This can never exeeds 1V DC and so the maximum value of I-prim, maximum current through FET 7518, is determined. In case load needs more than the maximum power, by then the I-prim is already at his maximum level so the SMPS will go in overload protection (see also foldback principle explained at overload protection).

9.3.9 *Cycle-by-cycle control*

The T-on control is regulated on a cycle-by-cycle basis see block C in IC7520. This means that in every cycle the T-on is determined again. By doing so the secondary voltages control, peak current limitation and all protections is very accurate and fast.

9.3.10 *Slow-start*

As soon as Vpin 1 > 14.5 Volts DC the SMPS will start-up. This will be done by a slow-start procedure where both the frequency and the duty cycle will be built up. The following three phenomena's will take place during start-up:

- The frequency will slowly increase to the nominal frequency of 40 kHz for normal operation and 20 kHz for standby). This is realized via the demagnetization function at pin 8; via this "DEMAG" function, FET 7518 will only conduct and T-on will become "high", when T5545 is totally demagnetized.
- The voltage at pin 5 determines the foldback point. As during start-up this pin 5 is gradually built-up, the foldback point will also gradually increase, see foldback principle explained at overload protection.
- The duty cycle will slowly increase beginning with the absolute lowest possible duty cycle. The maximum duty cycle is determined by C2530 at pin 11 of IC7520, as C2530 is unchanged at start-up.

9.3.11 *Standby mode*

In standby mode the load will get under a certain threshold level, decrease; see description of standby on the secondary side. The SMPS will determine this threshold level and switch to the so called "reduced frequency mode" at about 20 kHz; this minimal load threshold level is determined by R3532 at pin 12. In the L7.3 chassis the SMPS does not have a burst mode in standby but only a reduced frequency mode of about 20 kHz. In normal operation mode the internal oscillator is about 40 kHz. This frequency is controlled by C2531 at pin 10 of IC7520 and by R3537 at pin 16 of IC7520. In standby mode the internal oscillator is about 20 kHz.; this frequency is controlled by R3536 at pin 15 of IC7520.

9.3.12 *FET 7518 gate regulation*

D6514 prevents pin 3 of IC7520 of becoming negative because this will destroy the IC due to stray inductance in the gate part.

The safety resistor R3525 limits the drive current to the gate of FET 7518. In a stable situation Vpin 14 is typical 2V4.

9.3.13 *Typical values for the L7.3 chassis*

Mains Voltage:	
90 - 276V multi voltage	150 - 276V single voltage

Mains frequency: 50 Hz , 60 Hz

Power consumption	in normal mode:
25"	75W + /- 10%
29"	90W +/- 10%

Power Consumption in stand-by mode: 11W

9.4 Protections

9.4.1 *Over voltage protection of the secondary voltages*

After start-up the supply voltage pin 1 will be take over by positive winding 8 - 9 and after start up pin 1 is the measuring point for the secondary output voltage. After start-up via an internal switch pin 1 is internally tapped (voltage divider) to a voltage which can be measured at pin 6; pin 6 is also a measuring point for the secondary output voltages. If the voltage at pin 6 > 2.5 Volts, the logic in IC 7520 will shut down the output pin 3. This 2.5 Volts threshold at pin 6 is equivalent to 16 Volts DC which is equivalent to a voltage at the supply voltage (V BATT of approx. 108 Volts DC in normal operation and 130 Volts DC in standby. After switching "off", the IC starts up again because of over voltage protection; see slow-start.

REMARK: In case an overvoltage situation is sensed at the secondary output voltages, the SMPS will go in protection; in case the overvoltage situation remains present the SMPS will start slow, etc.; this is a very good audible hick-up mode.

9.4.2 *Under voltage protection of the secondary voltages*

If the supply voltage at pin 1 < 9 Volts DC the output pulse at pin 3 will be shut down.

Note: The DC voltage at pin 1 is equivalent to a voltage at V BATT of approx. 70V DC in normal operation and the voltage at pin 1 of 7.5 Volts is equivalent to a voltage at (V BATT of approx. 55V DC in normal operation and 65V DC in standby. In case an over voltage situation is sensed at the secondary output voltages, the SMPS will first switch "off" the pulses and later the complete IC 7520 will be switched "off". In case the IC 7520 is switched "off" also the SMPS will switch "off". In case the under voltage situation remains present, the SMPS will give under voltage protection like slow-start, etc; this is a very good audible hick-up mode.

9.4.3 *Unload protection*

In case the load goes down e.g. the line goes down because of stand-by mode or some failure in the line circuitry this will be detected by IC7520 via I-prim and secondary output voltages sensing. In case the load decreases below a certain threshold the SMPS will switch in "reduced frequency mode" of about 20 kHz ; this threshold is determined by the voltage level at pin 12 of IC 7520.

REMARK: In case of an unload situation the set will switch to "low frequency mode" or standby mode. Whether this unload situation of the SMPS is caused by the standby command or by a failure e.g. in the line circuitry this can be determined by switching on the set again which the remote control. In case of standby mode the TV will switch "on" again; in case of unload situation the set will NOT switch "on".

9.4.4 *Overload (short-circuit) protection*

If the secondary load becomes too high, I-prim also becomes too high; this is sensed by the current sense voltage at pin 7. This voltage at pin 7 is not allowed to exceed 1 Volts DC and it has current limiting. As the I-prim is limited, the secondary output voltages will drop and supply voltage at pin 1 will also drop. As soon as pin 1 < 9Volts DC the driving pulses at pin 3 will stop. As a result of these two mechanisms in case of an overload the secondary voltages will drop very fast, this is called the foldback mechanism. The foldback point can be adjusted by pin 5 of IC7520 and this point is adjusted to a maximum tolerable output power of 85W at 90 Volts AC and 165W at 276Volts AC. After this foldback the IC starts up again (see slow-start); in case the overload situation remains present, the SMPS will give foldback again, slow-start, etc.: as a result in case of short-circuit or overload the TV will be in a good audible hick-up mode.

9.5 Secondary side

9.5.1 *Output voltages*

See 9.1.2 for output voltages.

9.5.2 *Regulator IC TDA 8319 (7541)*

This is a low-dropout regulator. This IC has an output voltage of +5 Volts , +8 Volts and RESET signal; the input is 11 Volts.

The Pin configuration of this IC is listed below:

- Pin 1 of the IC is input 1 and the output 1 pin 9 that is +5 Volts DC.
- Pin 2 of the IC is input 2 and the output 1 pin 8 that is +8 Volts DC.
- Pin 3 of the IC is a timing capacitor input and controls the turn-on delay of the reset signal.
- Pin 4 of the IC is a disable pin connected to standby pin of the microcontroller, if the voltage below 0.5 Volts the +8 Volts output will be disabled.
- Pin 5 of the IC is a common ground .
- Pin 6 of the IC is a reset voltage output connected to the microcontroller. This reset output is developed with respect +5 Volts output level of 4.95 Volts.
- Pin 7 of the IC is a program pin for output 2, in this circuit this output pin 8 is programmed to +8.2 Volts by resistors 3552, 3553 and 3554.

Other features of this IC:

- Built-in thermal protection.
- Built-in over current and short circuit protection for +5 Volts and +8Volts.
- Low dropout voltage

9.6 SINGLE CHIP PROCESSOR IC7225 (=TDA8374)

Introduction :

In this chip most of the video, audio and sync circuits are integrated and in the diagrams the IC is split up into 5 parts: 5A,5B,5C,5D and 5E.

- IC7225-5A, video detector ,see diagram A4.
- IC7225-5B, source select en PAL demodulator ,see diagram A6.
- IC7225-5C, video control, see diagram A4.
- IC7225-5D, horizontal and vertical sync, see diagram A3.
- IC7225-5E, mono sound demodulator, see diagram A4.

9.6.1 IC7225-5A, IF video detector, see diagram A4

Tuning system

For the tuner 1000 there are two possibilities: VST type or PLL type and in both cases the tuner is controlled by the uC. The VST tuner is controlled via V_TUNE, AFC and the BS1, BS2 band switching signals; the PLL tuner is fully I2C controlled. IC 7225-5A contains the IF amplifier and the IF detector, the IF signal is present at the output pin 11 of the tuner. BS1 and BS2 (pin 17-18) switching signals used for band switching of a VST tuner.

	BS1	BS2
VHF1	0	1
VHF2	1	0
UHF	1	1

IF bands pass filter , the IF bands pass characteristic is determined by the band-pass of the SAW filter 1015, listed below you will find the possibilities :

- For PAL BG sets a SAW filter with 5.5 MHz bandwidth is used (33.4 to 38.9 MHz).
- For PAL 1 sets a SAW filter with a bandwidth of 6.0 MHz is used (32.9 to 38.9 MHz).
- For PAL BG/SECAM BG/LL' sets a SAW filter with 6.5 MHz band switch is used to enable BG/I/LL' reception (33.9 to 40.4 MHz).
- For PAL BG/SECAM BG/DK sets a SAW filter with a bandwidth of 6.5 MHz is used (32.4 to 38.9 MHz).

IF-demodulator

IF-demodulation is done with reference circuit L5260 at pin 3 and 4 of IC7225-5A; AGC control of tuner via pin 54 IC7225-5A. Top sync level is used for AGC inside IC7225-5A. AGC adjustment is done by 1(C control via entry into the SAM service menu. C2202 at pin 53 determines time constant of the AGC. Base band CVBS signal at pin 6 of IC7225-5A (normal -3V2) is fed to the sound trap filters (1206, 1207, 1208, 1209 and 5206) and returns to pin 13 of IC7225-5B for source selection and video processing (diagram A6). The NTSC_ SW signal from the control microprocessor switches on transistors 7216 and 7217 to activate filter 1209 when an NTSC signal is received. Demodulation for sound IF takes place for the various signals as follows: For single mono signal, the CVBS_Sound signal goes to filter 1104 for 4.5 MHz and filter 1102 for 5.5MHz. The sound _IF is connected to pin 1 of IC7225-5E for demodulation.

9.6.2 PAL/NTSC Processing (IC7225-5B, see diagram A6)

IC7225-5B contains : source selector and PAL/NTSC colour decoder.

The main functions are :

- Source Selection
  The input selector has CVBS_INT< CVBS_EXT1,Y_CVBSEXT2, C_EXT2 as inputs which can be selected via the 12C bus.
- Colour Decoder; the main functions are :
  - PLL/VCO
    The PLL operates during the burst key period. It synchronizes the VCXO oscillator with the frequency and phase of the incoming chroma burst. For alternating burst (PAL standards), a loop filter enables the PLL to synchronize with the average burst (180 degrees phase).

- PAL/NTSC Identification
- Secam Interface
  The 0 and 90 degrees reference signals from the VCO oscillator are supplied via the HUE phase circuit to the (B-Y) and (R-Y) burst demodulators respectively. The demodulated burst from the (B-Y) burst demodulator is supplied both to ACC detector and NTSC indent circuit; the NSTC indent circuit is an integrator. Once the integrator output exceeds the NTSC killer level, an NTSC burst has been identified (IDN=1). Therefore the IDN information provided the ASM (Automatic System Manager) with NTSC colour indent information. The demodulated burst from the burst from the (R-Y) burst demodulator is supplied to the PAL identcircuit via a AL switch; the PAL ident circuit is also an integrator. Once the integrator output exceed the PAL killer level, a PAL burst has been identified (IDP=1). The IDP information provides the ASM with PAL-colour ident information.
  The SECAM interface allows bi-directional communication between IC7241 (TDA8395) and the ASM for SECAM identification. If the VCO oscillator is oscillating at 4.43 MHz, the reference frequency of 4.43mhz is superimposed on a DC level and is supplied from pin 33 of IC7225 to pin 1 of IC7241. If PAL/NTSC signals are identified, the reference frequency is continuously available at pin 33 and superimposed on a 1.5V DC level. When SECAM is identified by IC7241, the reference signals which is generated in packets form and superimposed on a 5V DC level is supplied to pin 33 of IC7225.The ident signal (IDSM=1) is supplied to the ASM.
- ASM (Automatic System Manager)
- (R-Y)/(B-Y) demodulation
  The ASM is able to decode PAL/NTSC colour standards and in combination with IC7241(TDA8395), multi standard applications can be realized. The different possibilities are controlled by the 12C bus input commands which are communicated to the ASM via the 12C bus. The 12C bus input commands also indicates which crystals must be connected to pins 34 and 35. This is essential for correct calibration of the horizontal oscillator.
  For PAL/NTSC standards, the (B-Y)/(R-Y) baseband signals are extracted from the chroma signal by the (B-Y)/(R-Y) demodulators, filtered and supplied via the output switch to pins 29 and 30. If SECAM is identified by the SECAM decoder IC7241 and no PAL/NTSC is identified by the ASM, then the ASM will open the switch (B-Y)/(R-Y). This implies (B-Y)/(R-Y) signals from the SECAM decoder will be directly connected to pin 29 and 30 without extra loading.

9.6.3 Video controller (IC7225-5C, see diagram A4)

The main functions are :

– Y/(B-Y)/(R-Y) signal processing/matrix
– RGB signal selection/processing/output stages
– Black stretcher
– Beam current limiter (BCL,PWL)
– Automatic black current stabilization (ABS) .

Y/(B-Y)/(R-Y) signal processing/matrix

The luminance at pin 27 is internally AC coupled to the luminance clamp, which is operational during burst key period. The luminance signal is supplied to the RGB matrix circuit via the black stretcher. The (B-Y)/(R-Y) signals supplied to pins 31 and 32 are clamped during the burst key period. The signals are then supplied to the colour difference matrix to select the desired matrix formv either PAL, NTSC or Japanese NTSC matrix. The selected matrix is controlled via the 12C bus. For RGB matrix the signal outputs from the colour difference matrix are added with the luminance signal in colour to generate the internal RGB signals.

RGB signal selection/processing/output stages

Within the RGB signal selection there are three modes:

– RGB (internal)
– Fast RGB insertion (R_TXT G_TXT B_TXT on pins 23, 24 and 25)
– OSD-mode

Teletext

Two different types of microprocessors IC7600/7601 are used: one with teletext(TXT) and one without teletext.

The micro-controllers are:

P83Cx66	42 pins	Normal	ROM size varies
SAA529x	52 pins	Control withTeletext	ROM size varies
P83CX69	52 pins	Control with Close caption	ROM size varies

Type of micro-controller	Type of tuning	System	Countries
P83Cx66	VST	PAL/SECAM	AP
	PLL	NTSC	Latam
SAA529x	VST	PAL/SECAM	AP
P83Cx169	PLL	BiNorma/ TriNorma	Latam

The oscillator to be used is 12MHz; a crystal oscillator will be used for all the micro-controllers.

- In case of TXT this function is integrated together with the control part in one and the same uC. This uC is indicated in the diagrams with the outer pin numbering.
- In case of no TXT another (C is used with less pins. This uC is indicated in the diagrams with the internal pin numbering.

In the description below, the pin numbers are the numbers mentioned outside the housing of IC 7600 (IC7600 with TXT and IC7601 without TXT). In case of the (C with integrated teletext function the CVBS-TXT signal is fed to pin 23, the TXT and OSD- information are combined at pins 32,33 and 34.

Before the RGB signal selection the RGB signals are clamped to similar DC level during burst key period. The selection is controlled by the RGB insertion input voltage at pin 26.

Voltage at pin 26	selected RGB signals
< 0.3V	RGB(internal)
0.9V < V < 3V	(R_TXT G_TXT B_TXT (fast insertion at pins 23, 24 and 25)
> 4V	OSD can be inserted at the RGB-out pins

The contrast, brightness and white-point RGB adjustment on the selected RGB signals are controlled by 12C commands. After the adjustment, three RGB black levels are added to the RGB signals. These three signals are blanked when the RGB blank signal is active. The RGB output stages supply the buffered RGB signals pins 21, 20 and 19.

Black Stretcher

The black stretcher circuit, which is only operational during line scan, extends the gray signal level towards the actual black level (= actual black level measured during burstkey). The amount of extension is dependent on the difference between actual black level and the darkest part of the incoming video signal. The darkest part of the videosignal is registered in the capacitor at pin 39 by means of an internal discharge current of approximately 130uA. The black stretcher is made inactive if the voltage at pin 39 is set to ground. This is done by turning on transistor 7220, the command blackstraw coming from the microprocessor (if power button on the remote control unit is activated).

Beam Current Limiter

The beam current limiter circuit functions as an average white limiter as well as peak white limiter. The average white limiter needs external circuitry comprising of 7265, and associated components to function; the peak white limiter is an internal detection circuit. The function of the beam current limiter (average white / peak white limiter) reduces the contrast and brightness of RGB signals. For beam current limiting, the difference in beam current (1BCL) and an internal charge current (1CHARGE) is stored in capacitor 2460 on pin 22. If 1BCL > 1CHARGE voltage (VBCL) at pin 22 will decrease. For beam current limiter contrast reduction begins if VBCL < 3.5V and brightness reduction begins if VBCL < 2.5V. VBCL is normally about 4V if the beam current limiter is not active .

The contrast and/or brightness reduction of the RGBout is proportional to the voltage decrease at pin 22.

9.6.4 Horizontal synchronization IC 7225-5D and the line output stage (see diagram A3)

Protections:

The line deflection incorporates protections like:

- X-ray protection. If the EHT will become too high, the tube will radiate too much X-ray, this is detected by monitoring the flyback pulses at pin 11 of the LOT.
- Beam current protection. If the beamcurrent becomes too high the Bimos is able to reduces this by making the EHT_info line low. The circuitry around transistor 7481 in circuit diagram A2, will detect this and create a PROT signal.
- The E/W amplifier has two protections. One protection for overcurrent, for exampleshort circuit of E/W FET and one protection for overvoltage; like interrupted capacitor in lower half of the diode modulator.

Start-up of the horizontal oscillator via the (8V gives a start-up current to pin 37; if the voltage on pin 37 exceeds 5V6 the horizontal oscillator starts to oscillates at approx. 25kHz. Only if the supply pin of IC 7225 (= pin 12 at IC 7225-5A in diagram A4) becomes 8V the line frequency will change to 15625 Hz. The horizontal synchronization separator separates horizontal pulses out of CVBS signals and synchronizes the free-running horizontal sawtooth generator. The horizontal oscillator sawtooth is converted into a square wave voltage with variable duty cycle. This square wave at pin 40 is fed to the line output stage. The time constant of the synchronization circuit is automatically internally determined by IC 7225-5D. Pin 41 is SANDCASTLE output and also HORIZONTAL FLYBACK input.

- The SANDCASTLE has an output current a some mA, the amplitudes of sandcastle pulse is : burst 5V3, line blanking 3V and during frame blanking 2V.
- If the input acts as a HORIZONTAL FLYBACK pulse, the input has a current of 100-300 mA. This horizontal flyback pulse compares the phase of flyback pulse with phase of the horizontal oscillator; if the phase is not correct the duty cycle of horizontal oscillator will be adjusted.
- Flash protection: The BCI info is applied to pin 42 of IC7225-5D. If due to a flash in the picture tube the voltage at pin 42 is > 6V, the horizontal drive will be switched off immediately. If the voltage is again < 6V the horizontal drive will be switched on again via the slow start procedure.
- EHT over voltage protection. The BCI info is also applied to pin 50 of IC7225-5D. First the BCI will compensate vertical picture amplitude variations due to beam current variations. The control range is between 1.2V and 2.8V. However if the voltage at pin 50 exceeds 3.9V the EHT overvoltage protection will be activated and the horizontal drive is switched off.

The line output circuitry
In principle the line output stage pin 40 of IC 7225-5D drives the line output stage consisting of TS 7445 and transformer 5445 via drivers TS 7440-7441. The line output stage supplies the deflection current and the following supply voltages (see also the power supply block diagram) :

Output voltage (See diagram A2) LOT (5445 Line output transformer) output voltage

- EHT, + 200V, Vg2, focus and ff for the picture tube.
- 200V for the CRT drive
- + 5V for the control and tuner supply
- + 9V for the tuner supply
- + 11V for the control and vertical drive output
- - 11V for the vertical drive output

Vertical synchronization IC 7225-5D and the frame amplifier IC 7401
The vertical oscillator (= 50Hz) is controlled by the incoming video signal. The vertical output is driven in anti-phase via the pins 46 and 47. At pin 41 the so called "Sandcastle " pulse is present; the sandcastle pulse is applied to several parts of the circuits for timing purposes.

Frame amplifier
In principal the frame output stage IC 7401 (TDA9302H) is used for the vertical deflection. This IC is controlled at pins 1 and 3 by the vertical control signal of IC 7225-5D and a deflection current is generated at pin 5. The vertical flyback signal is generated at pin 3 of this IC.

Protection of IC 7401; depending on +11V and -11V supply to drive the vertical deflection CRT. In case of supply voltage +11V or -11V needs a too high current, the VFL pin 3 of IC 7401 voltage will drop < 6.5V. As a result the VFL will feedback this to pin 37 of 7600 micro processor and this will switch the supply to stand-by mode.

9.6.5 Sound detector (IC7225-5E, diagram A4)

Single FM-mono sound for demodulation will take place in IC7225-5E. No adjustment are required because of automatic PLL tuning from 4.2 to 6.8 MHz .

9.7 Information of NVRam, tuners, video and audio I.C.'s.

The following components are also applied in this chassis:

- IC7620 in circuit diagram A5: NVRAM : ST24W04B1 (Non-Volatile Memory). The ST24W04B1 is a 4k bit EEPROM device. The enable pins E1 and E2 selects between maximal four different ST24W04B ICs. Last status of a set is stored in the EEPROM and can be retrieved whenever there is a power interruption
- Tuner 1000 in circuit diagram A4: UV1355 or UV1336 is applied :
  The list of tuners is as follows:
  For 25” and 29” AP, tuner type UV1335 is used; Type of tuning is VST.
  For 25” and 29” Latam, tuner type UV1336 is used; Type of tuning is PLL.
- Audio IC's:
  - IC7310: TDA9860, Audio processor IC
  - IC7315: TDA9850, BTSC DBX decoder with SAP
  - IC7312: AN 7312, AVC= automatic Volume Correction
  - IC7202: MSP3410D, Nicam stereo decoder
  - IC7202: MSP3400C, 2CS Korea and 2CS German decoder
  - IC7313: HEF4052, switch function IC
  - IC7311: TDA7057A , 2X3W stereo sound amplifier

For European and A/P sets we can have 2CS, mono/stereo/ dual sound: this is decoded by IC7202(=MSP3400/MSP3410) on Nicam sound panel "C". Also Nicam mono/stereo/dual sound is decoded by IC7202.

For A/P, Latam and USA we use the BTSC decoding ; see IC7315 in circuit diagram A8.

NTSC/SECAM sound system IC (BTSC decoding IC)

General description of BTSC specifications

The BTSC sound system is based on the AM-FM method and is capable of broadcasting:

- MONO information {only MONO Carrier modulated}
- STEREO information {MONO C -> 1/2(L+R) and STEREO SC -> 1/2(L-R)}
- DUAL information {MONO C -> language A and SAP SC -> language B}

– STEREO & SAP information
– STEREO: {MONO C -> 1/2(L+R) and STEREO SC-> 1/2(L-R)} and SAP:{second audio channel}

The sinlge FM-mono sound decoding will take place in IC7225-E; see circuit diagram A4.

IC7312 (= AN7318S) in diagram A7 is an Automatic Volume Correction (AVC) present. Automatic volume correction (AVC) function provides a constant output level of -18dBFS for input levels between 0dBFS and -24dBFS. In this way it is possible to adjust different sound sources (eg Terrestric/SAT channels, SCART) to equal volume level. The increased volume of advertising is compensated as well. The volume correction step width is quasi continuosly. The filter maximum is performed with an attack time of 16ms and a programmable decay time i.e 8,4,2 sec and 20ms

IC7311: TDA7057AQ in circuit diagram A7 is a 2X3W stereo sound amplifier.

BLOCK DIAGRAM MC44603P

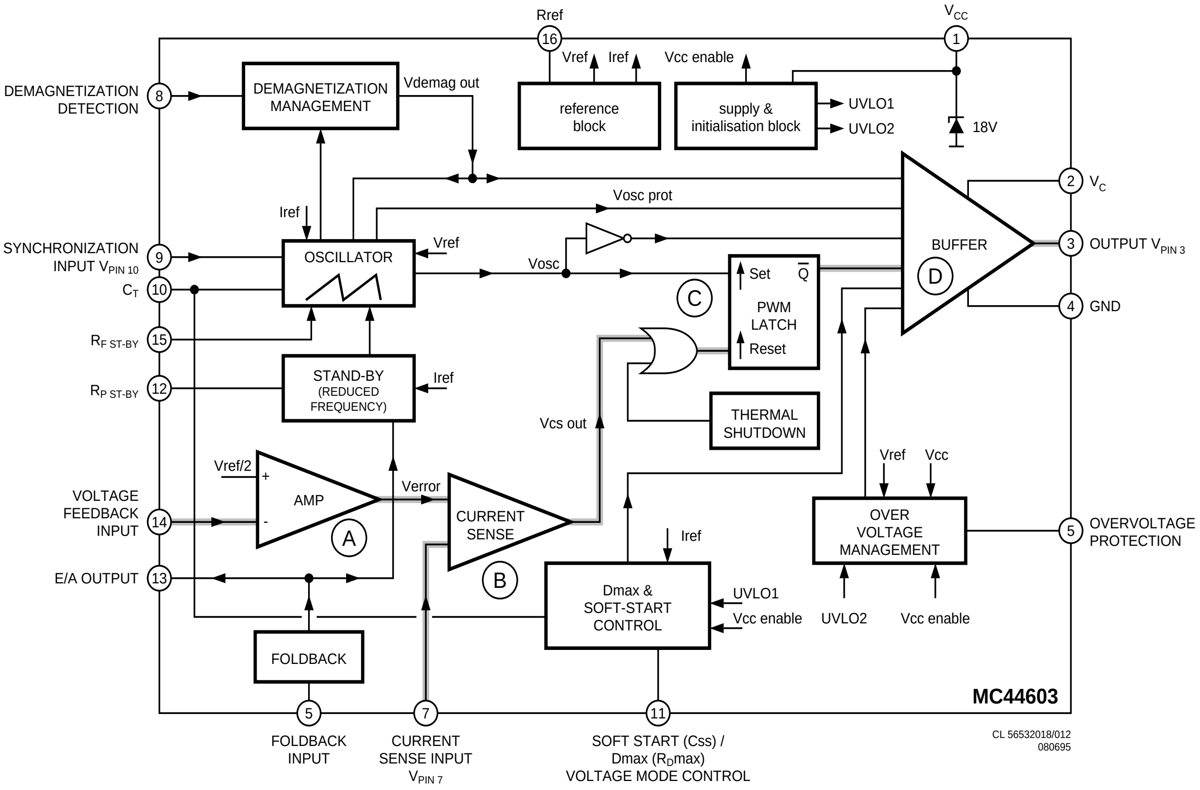
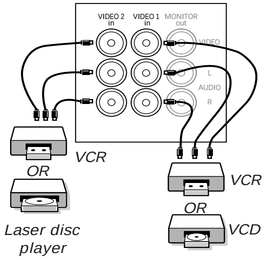

Rref
16
VCC
1
Vref
Iref
Vcc enable
DEMAGNETIZATION DETECTION
8
DEMAGNETIZATION MANAGEMENT
Vdemag out
reference block
supply & initialisation block
UVLO1
UVLO2
18V
2
VC
Vosc prot
Iref
SYNCHRONIZATION INPUT VPIN 10
9
OSCILLATOR
Vref
Vosc
3
OUTPUT VPIN 3
BUFFER
D
Set
Q̄
PWM LATCH
Reset
C
CT
10
4
GND
RF ST-BY
15
RP ST-BY
12
STAND-BY (REDUCED FREQUENCY)
Iref
THERMAL SHUTDOWN
Vcs out
Vref
Vcc
Vref/2
+
-
AMP
A
Verror
CURRENT SENSE
B
VOLTAGE FEEDBACK INPUT
14
OVER VOLTAGE MANAGEMENT
5
OVERVOLTAGE PROTECTION
Iref
E/A OUTPUT
13
Dmax & SOFT-START CONTROL
UVLO1
Vcc enable
UVLO2
Vcc enable
FOLDBACK
MC44603
5
7
11
FOLDBACK INPUT
CURRENT SENSE INPUT VPIN 7
SOFT START (Css) / Dmax (RDmax) VOLTAGE MODE CONTROL
CL 56532018/012 080695

Figure 9-1

Connecting peripheral equipment

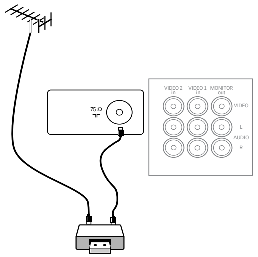
Equipment such as VCR, Laser disc player, VCD etc. could be connected to the video and audio (AV) sockets at the back of the TV. Switch off the TV and equipment before making any connection.

Connection for playback


VIDEO 2 in
VIDEO 1 in
MONITOR out
VIDEO
L
AUDIO
R
VCR
OR
Laser disc player
VCR
OR
VCD

1. Connect to AV sockets
   - connect the corresponding sockets of the equipment to that of the TV.
   - to view the playback, select a channel named AV1 (if connection is made to sockets at VIDEO 1 in) or AV2 (if connection is made to sockets at VIDEO 2 in).

Note : If you have connected a computer game set to VIDEO 1 in, select a channel named GAME1 to playback. If your connection is made to VIDEO 2 in, then select GAME2 to playback.

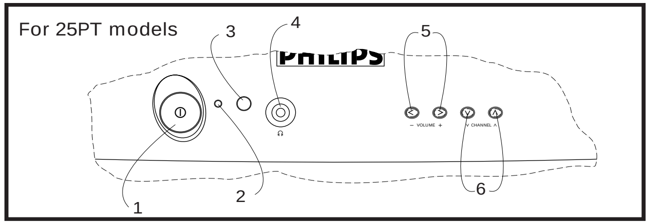

75 Ω
VIDEO 2 in
VIDEO 1 in
MONITOR out
VIDEO
L
AUDIO
R

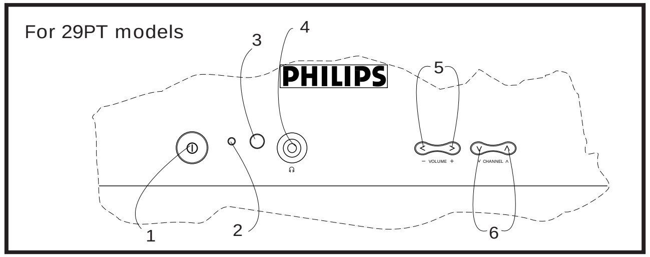
2. Connect to aerial socket (only for VCR)

The playback on your VCR is considered a TV channel by your TV if you connect via the aerial socket. You must tune in to your VCR's test signal and assign the channel number 0 to it. Refer to your VCR's instruction manual for more details.

- connect the RF cable to the VCR's "RF in" and connect the "RF out" of the VCR to the aerial socket of the TV.
- select channel 0 and tune in to to your VCR's signal.
- to view the playback, select channel 0.

The TV's controls

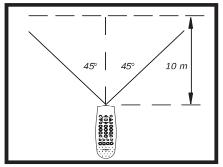

For 25PT models
PHILIPS
VOLUME
CHANNEL
1
2
3
4
5
6

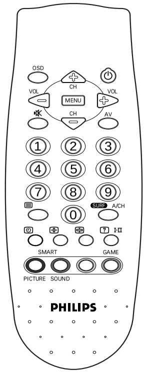

For 29PT models
PHILIPS
VOLUME
CHANNEL
1
2
3
4
5
6

1. Mains power	Switch on or off the TV.
2. Red light indicator	When light is on, it indicates that the TV is on standby. Note :If no signal is detected by the TV after 10 minutes, it will switch to standby automatically.
3. Remote control sensor	For the remote control to work, it must be activated within the operating range of this sensor.
4. Headphone socket	For connection of headphones.
5. Volume adjustment	To adjust volume level. Press these 2 keys simultaneously will call up the 1st level menu. Press these 2 keys again will exit menu. Works as cursor left (VOLUME −) or right (VOLUME +) in a menu.
6. Channel selection	To select a lower or higher channel number. Works as cursor up (CHANNEL ∧) or down (CHANNEL ∨) in a menu.

Using the remote control

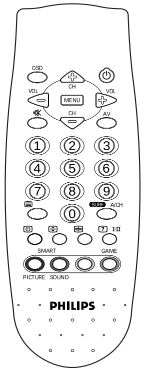
For the remote control to work effectively, it has to be operated within the recommended operating range to the remote control sensor on the TV.





Press :	Result :
OSD Screen information	In TV mode : Display channel number and sound mode In a menu : Exit menu.
⏻ Standby	Switch off TV and a red indicator lights up. To switch on TV again, press either the ⓪ to ⑨, CH +, CH −, SURF A/CH, AV or ⏻ key.
AV External source	Select the external channels AV1 or AV2.
🔇 Mute	Switch off the sound of the TV. Press again to switch on the sound.
MENU Menu	Call up the main menu. If there is an existing menu, pressing this key will bring you back to the previous level menu. If you are in the 1st level menu, pressing this will exit the menu.
CH + CH − Channel selection/ cursor up or down	TV mode : Select a higher or lower channel number . In a menu : Scroll up or down.

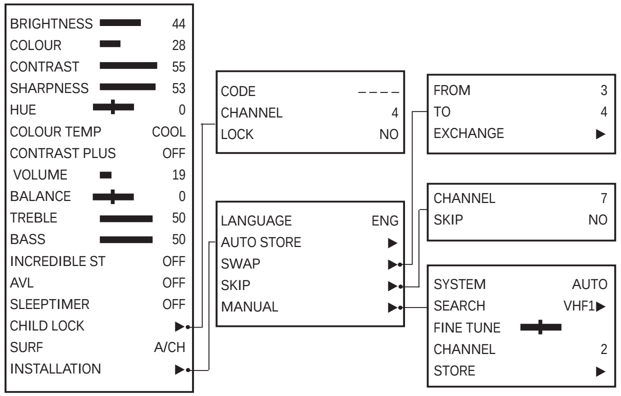
...using the remote control



Press :	Result :
VOL + VOL − Volume adjustment /cursor right or left	TV mode : Adjust the volume of the TV set. In a menu : Select or execute.
⓪ to ⑨ Digit	Key in numerals e.g. confidential code in child lock and in channel selection. For a 2-digit channel, the second numeral must be entered before the dash disappears.
SURF A/CH Surf or alternate channel	Surf mode : Add or delete channel from the surf list. View channel in the surf list. A/CH mode : Return to the previous channel.
Teletext function: I-II SMART SLEEPTIMER GAME PICTURE SOUND	Refer to the section on “Teletext”.
I-II Sound mode	Switch from stereo to mono sound (for stereo transmission) or choose between first language or second language (for bilingual transmission).
GAME Game	Select preset channels for games.
SMART PICTURE SOUND Smart controls	Select the presets for sound and picture.

Menus

1st level | 2nd level | 3rd level



1st level	
BRIGHTNESS	44
COLOUR	28
CONTRAST	55
SHARPNESS	53
HUE	0
COLOUR TEMP	COOL
CONTRAST PLUS	OFF
VOLUME	19
BALANCE	0
TREBLE	50
BASS	50
INCREDIBLE ST	OFF
AVL	OFF
SLEEPTIMER	OFF
CHILD LOCK	►
SURF	A/CH
INSTALLATION	►

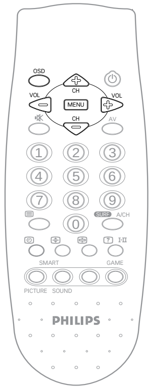
2nd level (CHILD LOCK)	
CODE	– – – –
CHANNEL	4
LOCK	NO

2nd level (INSTALLATION)	
LANGUAGE	ENG
AUTO STORE	►
SWAP	►
SKIP	►
MANUAL	►

3rd level (SWAP)	
FROM	3
TO	4
EXCHANGE	►

3rd level (SKIP)	
CHANNEL	7
SKIP	NO

3rd level (MANUAL)	
SYSTEM	AUTO
SEARCH	VHF1►
FINE TUNE	
CHANNEL	2
STORE	►

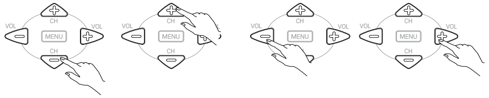


To call up the 1st level menu :

- Press MENU key.

To use the menus:

- Press the cursor keys.



scroll up *scroll down* *select or execute*

To exit from a menu:

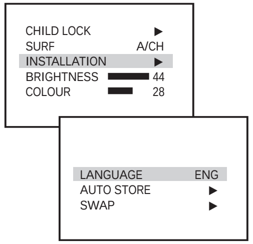
- Press MENU key to go back to the previous level.

OR

- Press OSD key to exit.

Installing the TV

Selecting the menu language



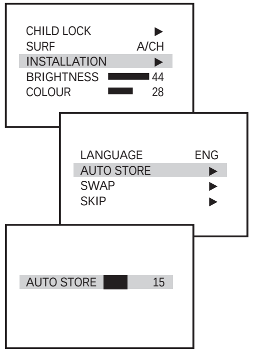
CHILD LOCK	►
SURF	A/CH
INSTALLATION	►
BRIGHTNESS	44
COLOUR	28

LANGUAGE	ENG
AUTO STORE	►
SWAP	►

1. Call up 1st level menu with the MENU key.
2. Scroll up with the ▲ key to highlight INSTALLATION.
3. Select INSTALLATION with the ◄ or ► key.
   LANGUAGE is highlighted.
4. Select the language of your choice with the ◄ or ► key.
   From now on, all menus and screen information will be in the language that you have chosen.
5. Exit with the OSD key.

Tuning in the TV channels

There are 2 ways to tune in channels : automatically (by AUTO STORE) or manually (by MANUAL menu).



CHILD LOCK	►
SURF	A/CH
INSTALLATION	►
BRIGHTNESS	44
COLOUR	28

LANGUAGE	ENG
AUTO STORE	►
SWAP	►
SKIP	►

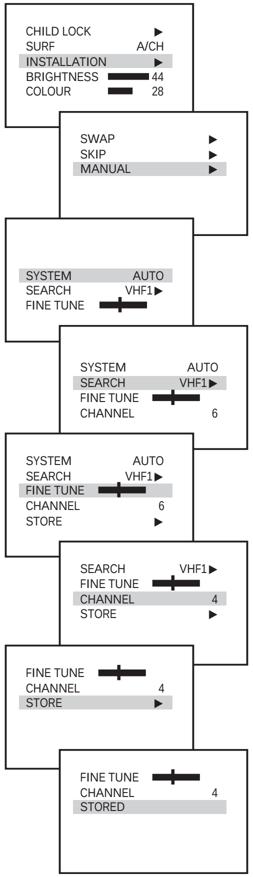
AUTO STORE	15

Auto store

Use to tune in channels automatically.

1. Call up 1st level menu with the MENU key.
2. Scroll up with the ▲ key to highlight INSTALLATION.
3. Select INSTALLATION with the ◄ or ► key.
4. Scroll down with the ▼ key to highlight AUTO STORE.
5. Select AUTO STORE with the ◄ or ► key.

A tuning bar appears and the TV will automatically store all available channels. Channels will be stored starting from the next channel number .


CHILD LOCK ►
SURF A/CH
INSTALLATION ►
BRIGHTNESS 44
COLOUR 28
SWAP ►
SKIP ►
MANUAL ►
SYSTEM AUTO
SEARCH VHF1►
FINE TUNE
SYSTEM AUTO
SEARCH VHF1►
FINE TUNE
CHANNEL 6
SYSTEM AUTO
SEARCH VHF1►
FINE TUNE
CHANNEL 6
STORE ►
SEARCH VHF1►
FINE TUNE
CHANNEL 4
STORE ►
FINE TUNE
CHANNEL 4
STORE ►
FINE TUNE
CHANNEL 4
STORED

Manual

This menu enables you to search and store every available channel manually.

1. Call up 1st level menu with the MENU key.
2. Scroll up with the ▲ key to highlight INSTALLATION.
3. Select INSTALLATION with the ◄ or ► key.
4. Scroll down with the ▼ key to highlight MANUAL .
5. Select MANUAL with the ◄ or ► key.
6. Scroll down with the ▼ key to highlight SEARCH.
7. Select the band (UHF, VHF1 or VHF3) with the ◄ key.
8. Press the ► key to start searching. Searching stops once a channel is available. If you decide to store the channel, proceed to the next step. If not, press the ► key to start searching again.
9. If you wish to fine tune the channel, scroll down to highlight FINE TUNE. Press the ◄ or ► key to fine tune.
10. Scroll down with the ▼ key to highlight CHANNEL and assign a channel number to the channel that you found.
11. Scroll down with the ▼ key to highlight STORE and press the ◄ or ► key to store the channel.
12. Exit with the OSD key.

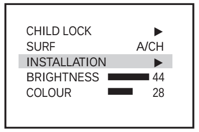
How to deal with poor picture reception

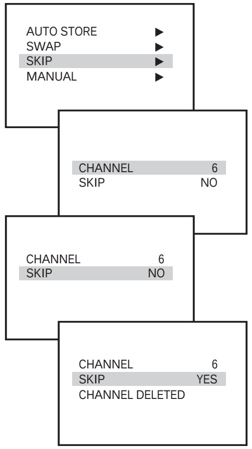
You can use these 3 ways to deal with poor picture reception of your TV

- Skip channels
- System selection (for multi and dual system sets only)
- Fine tuning

Do the following steps to go into INSTALLATION menu.

1. Call up 1st level menu with the MENU key.
2. Scroll up with the ▲ key to highlight INSTALLATION.
3. Select INSTALLATION with the ◄ or ► key.


CHILD LOCK ►
SURF A/CH
INSTALLATION ►
BRIGHTNESS 44
COLOUR 28


AUTO STORE ►
SWAP ►
SKIP ►
MANUAL ►
CHANNEL 6
SKIP NO
CHANNEL 6
SKIP NO
CHANNEL 6
SKIP YES
CHANNEL DELETED

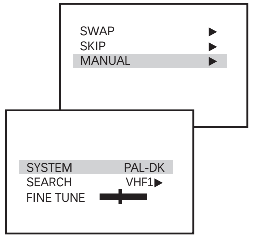
Skip channels

This menu enables you to skip channels which have bad reception or channels which you do not watched often. Once a channel is skipped, you will not be able to select it with the ▲ or ▼ keys.

1. Scroll down with the ▼ key to highlight SKIP.
2. Select with the ◄ or ► key. CHANNEL is highlighted.
3. Enter a channel number.
4. Scroll down with the ▼ key to highlight SKIP.
5. Select YES with the ◄ or ► key. CHANNEL DELETED appears to confirm that the channel is skipped.

To unskip channels, repeat step 3 to 5 but select NO instead of YES.

6. Exit with the OSD key.


SWAP ►
SKIP ►
MANUAL ►

SYSTEM PAL-DK
SEARCH VHF1►
FINE TUNE

System selection

For multi system sets:
This feature enables you to select either PAL-BG, PAL-I, PAL-DK, SECAM-DK, NTSC M or AUTO. If AUTO is selected, it means that the system is automatically selected according to the current transmission.

For dual system sets:
This feature enables you to select either PAL-DK or PAL-I.

For single system sets:
This feature is not selectable.

1. Scroll down with the ▼ key to highlight MANUAL .
   SYSTEM is highlighted.
2. Press the ◄ or ► key to select a suitable system.
3. Exit with the OSD key.

Sound settings

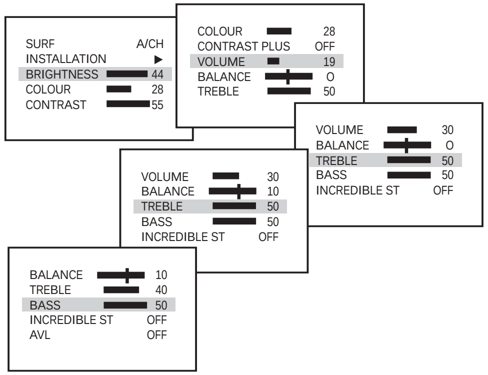
Personal settings

You can do adjustment on VOLUME, BALANCE, TREBLE and BASS of a picture via the 1st level menu. Adjustment on treble and bass will automatically be stored in the PERSONAL mode of the SMART SOUND feature.

How to do adjustment

1. Call up 1st level menu with the MENU key.
2. Scroll up or down with the ▲ or ▼ key to highlight the item that you wish to adjust.
3. Select or adjust with the ◄ or ► key.
4. Exit with the OSD key.

PHILIPS
MENU
OSD


SURF A/CH
INSTALLATION ►
BRIGHTNESS 44
COLOUR 28
CONTRAST 55

COLOUR 28
CONTRAST PLUS OFF
VOLUME 19
BALANCE O
TREBLE 50

VOLUME 30
BALANCE O
TREBLE 50
BASS 50
INCREDIBLE ST OFF

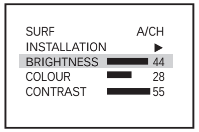
VOLUME 30
BALANCE 10
TREBLE 50
BASS 50
INCREDIBLE ST OFF

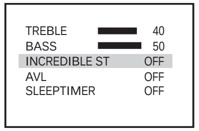
BALANCE 10
TREBLE 40
BASS 50
INCREDIBLE ST OFF
AVL OFF

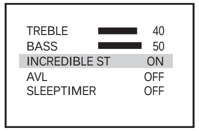
Incredible stereo

A feature to enhance stereo sound. Adjustment done will automatically be stored in the PERSONAL mode of the SMART SOUND feature.

1. Call up 1st level menu with the MENU key.
2. Scroll down with the ▼ key to highlight INCREDIBLE ST.
3. Select ON with the ◄ or ► key.
4. Exit with the OSD key.


SURF A/CH
INSTALLATION ►
BRIGHTNESS 44
COLOUR 28
CONTRAST 55


TREBLE 40
BASS 50
INCREDIBLE ST OFF
AVL OFF
SLEEPTIMER OFF

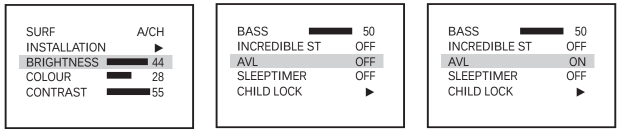

TREBLE 40
BASS 50
INCREDIBLE ST ON
AVL OFF
SLEEPTIMER OFF

...sound settings

AVL-Auto Volume Leveller

This feature if switched on will automatically adjust any sudden changes in the TV's volume to a preset level.

1. Call up 1st level menu with the MENU key.
2. Scroll down with the ▽ key to highlight AVL.
3. Select ON with the ⊖ or ⊕ key.
4. Exit with the OSD ○ key.



SURF A/CH
INSTALLATION ▶
BRIGHTNESS 44
COLOUR 28
CONTRAST 55

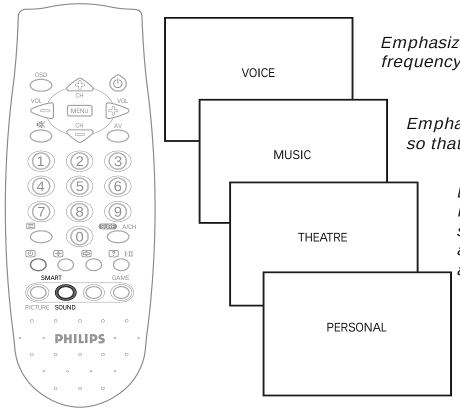
BASS 50
INCREDIBLE ST OFF
AVL OFF
SLEEPTIMER OFF
CHILD LOCK ▶

BASS 50
INCREDIBLE ST OFF
AVL ON
SLEEPTIMER OFF
CHILD LOCK ▶

Smart Sound

These are some sound presets on the TV for your viewing pleasure. Press the SMART ○ SOUND key repeatedly to select VOICE, MUSIC, THEATRE or PERSONAL*.

*(Note *: "NORMAL" for certain model)*



VOICE — *Emphasizes speech frequency.*

MUSIC — *Emphasizes bass frequency so that music is dynamic.*

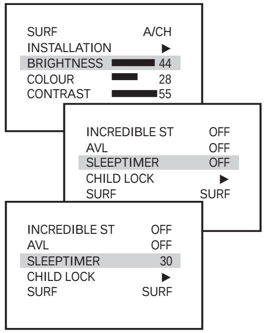
THEATRE — *Emphasizes low and high frequencies to give sensation to the action and a wider sound ambience.*

PERSONAL — *Your personal sound settings.*

Other features

Sleeptimer

Sets timer to switch TV to standby in steps of 15 minutes to a maximum of 120 minutes. To disable timer, set to "OFF".



SURF A/CH
INSTALLATION ▶
BRIGHTNESS 44
COLOUR 28
CONTRAST 55

INCREDIBLE ST OFF
AVL OFF
SLEEPTIMER OFF
CHILD LOCK ▶
SURF SURF

INCREDIBLE ST OFF
AVL OFF
SLEEPTIMER 30
CHILD LOCK ▶
SURF SURF

To set timer

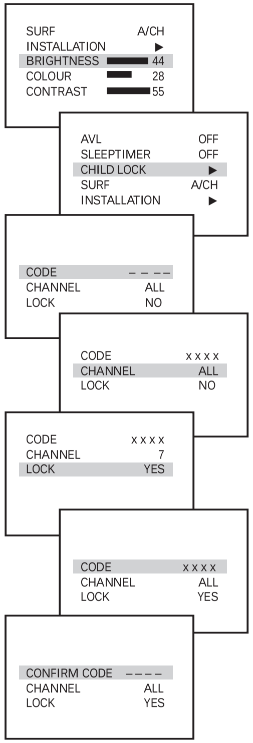
1. Call up 1st level menu with the MENU key.
2. Scroll down with the ▽ key to highlight SLEEPTIMER.
3. Select time period with the ⊖ or ⊕ key.
4. Exit with the OSD ○ key.

Child Lock

This feature enables you to lock channels which you do not wish others e.g. children to watch. You have a choice to lock all channels (inclusive of AV1 or AV2) or individual channel (up to a maximum of 5 channels). Once a channel is locked:

- if you call channels up with the CHANNEL ∨ or ∧ keys on the TV, there will be no picture and sound.
- access to the INSTALLATION sub-menu is disabled

You can only call up channels with your remote control. A message "LOCKED" and "CODE – – – –" appears on the screen each time you try to call up a channel with the controls on the TV. To bypass the lock mode, you will need to use your remote control to key in the 4-digit confidential code that you have entered when you locked it.

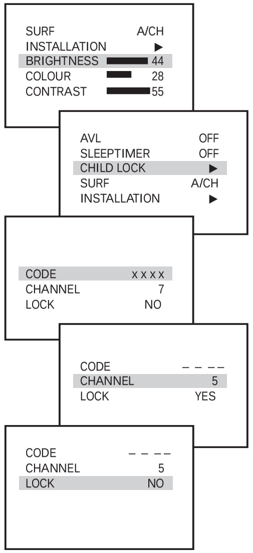

SURF A/CH
INSTALLATION ▶
BRIGHTNESS 44
COLOUR 28
CONTRAST 55
AVL OFF
SLEEPTIMER OFF
CHILD LOCK ▶
SURF A/CH
INSTALLATION ▶
CODE – – – –
CHANNEL ALL
LOCK NO
CODE x x x x
CHANNEL ALL
LOCK NO
CODE x x x x
CHANNEL 7
LOCK YES
CODE x x x x
CHANNEL ALL
LOCK YES
CONFIRM CODE – – – –
CHANNEL ALL
LOCK YES

To lock channels

1. Call up 1st level menu with the MENU key.
2. Scroll down with the ▽ key to highlight CHILD LOCK.
3. Press ◁ or ▷ key to enter menu.
4. Key in the universal code 8888.

If you do not key in the code, you will not be able to change anything on this menu.

5. Press ◁ or ▷ key to select ALL (to lock all channels) or enter a channel number (to lock individual channels).
6. Scroll down with the ▽ key to highlight LOCK.
7. Press ◁ or ▷ key to select YES to lock the selected channel/s.
8. Repeat steps 5 to 7 for other channels which you wish to lock. Once you have completed, proceed to the next step.
9. Scroll up with the △ key to highlight CODE. Key in your own 4-digit confidential code. “CONFIRM CODE” appears.
10. Key in the 4 digits again to confirm and use it whenever you want to access to locked channels.
11. Exit with the OSD key.


SURF A/CH
INSTALLATION ▶
BRIGHTNESS 44
COLOUR 28
CONTRAST 55
AVL OFF
SLEEPTIMER OFF
CHILD LOCK ▶
SURF A/CH
INSTALLATION ▶
CODE x x x x
CHANNEL 7
LOCK NO
CODE – – – –
CHANNEL 5
LOCK YES
CODE – – – –
CHANNEL 5
LOCK NO

To unlock channels

1. Call up 1st level menu with the MENU key.
2. Scroll down with the ▽ key to highlight CHILD LOCK.
3. Press ◁ or ▷ key to enter menu.
4. Key in the 4-digit confidential code which you have entered when you activate CHILD LOCK mode.

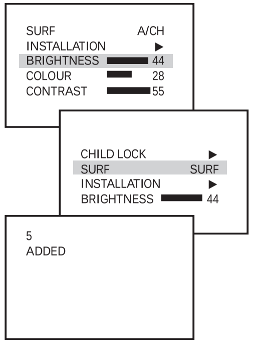
If you key in an incorrect code, all items in the child lock menu can be selected, but it is not possible to change any one of them. If you key in a correct code, CHANNEL will be automatically highlighted.
Tips : If you forget your confidential code, enter the universal code 8888.

5. Key in a channel number which you wish to unlock.
6. Scroll down with the ▽ key to highlight LOCK.
7. Press ◁ or ▷ key to select NO to unlock the selected channel.
8. Repeat steps 5 to 7 for other channels which you wish to unlock. Once you have completed, proceed to the next step.
9. Exit with the OSD key.

Surf

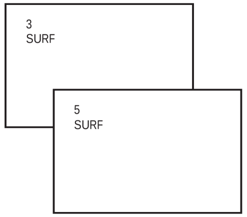
There are 2 selectable functions:

1. Surf : Create a list of channels (maximum 8) whereby when you press the SURF A/CH key on the remote control, you are able to quickly view through all these channels.
2. A/CH : When this is selected and if you press the SURF A/CH key on the remote control, you are able to see the previously watched channel.


SURF A/CH
INSTALLATION ▶
BRIGHTNESS 44
COLOUR 28
CONTRAST 55
CHILD LOCK ▶
SURF SURF
INSTALLATION ▶
BRIGHTNESS 44
5
ADDED

Creating a surf list

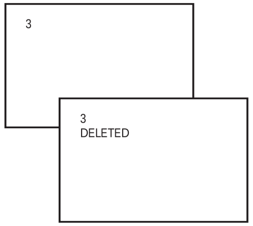
1. Call up 1st level menu with the MENU key.
2. Scroll up with the △ key to highlight SURF.
3. Select SURF with the ◁ or ▷ key.
4. Exit with the OSD key.
5. Select a channel. Press the SURF key within 4 seconds or while the channel number is still being displayed. “ADDED“ appears below the channel number. This means the channel is added to the surf list.
6. Repeat step 5 for other channels which you wish to add to the surf list.


3
SURF
5
SURF

How to call up channels in the surf list

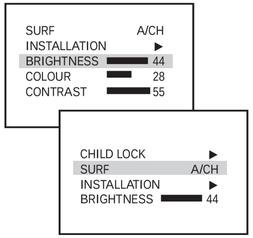
1. Press the SURF A/CH key once and the TV will switch to the next channel which is on the surf list OR

   Press and hold the SURF A/CH key to cycle through all the channels on the surf list.



Deleting channels from a surf list

1. Press the SURF A/CH key to call up channels in the surf list.
2. As soon as you find the channel you wish to delete, press the SURF A/CH key within 4 seconds or while the channel number is still being displayed. “DELETED“ appears below the channel number. This means the channel is deleted from the surf list.
3. Repeat step 1 to 2 for other channels which you wish to delete from the surf list.


SURF A/CH
INSTALLATION ▶
BRIGHTNESS 44
COLOUR 28
CONTRAST 55
CHILD LOCK ▶
SURF A/CH
INSTALLATION ▶
BRIGHTNESS 44

Selecting alternate channel (A/CH)

1. Call up 1st level menu with the MENU key.
2. Scroll up with the △ key to highlight SURF.
3. Select A/CH with the ◁ or ▷ key.
4. Exit with the OSD key.

When you are viewing a channel (e.g channel number 6) and if you wish to go back to the previous channel (e.g. channel number 3), press the SURF A/CH key once. If you wish to go back to channel number 6 again, press the SURF A/CH key again.

11 Abbreviations

(R-Y)_OUT	R-Y output from chroma demodulator
uC	Microcomputer
AQUA	Aquadaq layer on the outside of the picture tube
AV_MUTE	Signal to mute the sound on the Audio-out cinch
AVL_AV2/AVL	Switching signal from UP to the Auto Volume leveller on the ITT on BTSC Panel or Rear Cinch I/P 2 width CVBS. R and Sound
B_TXT_OSD	Blue TXT or OSD signal from (C to the video controller IC7225-5C
BASS	Control signal for BASS
BCI	Beam Current information
BG/1_or_BG/0 K	Monochrome TV system sound carrier + 5.5 MHz (BG), Sound carrier + 6 MHz(I), Sound carrier + 6.5 MHz (DK)
BL_TXT_OSD	Fast blanking signal to IC7725-5C to display OSD and TXT
BLACKSTR_SW	Black stretch switch
BS1	TV band selection 1 signal
BS2	TV band selection 2 signal
CHROMA_O/NTSC_SW	Switch on signal for NTSC chroma oscillator (3.575 MHz)
CHROMA_1/BG/L	Switch on signal for BG/L chroma oscillator (3.582 MHz)
CHROMA_1/STATUS	Switch on signal for NTSC chroma oscillator (3.579 MHz)
CHROMA_2/STATUS	Signal to select the correct system in case of trinorma
CVBS_EXT1	CVBS external 1 input signal
CVBS_EXT2	CVBS external 2 signal
CVBS_IN	CVBS internal 1 (from tuner)
CVBS_OUT	CVBS output signal
CVBS_OUT_1	CVBS output signal 1
CVBS_SOUND	CVBS for inter carrier sound detector
CVBS_TXT	CVBS for TXT processing in uC
DISCHARGE	To have a fast discharge after switching off the set
EAR	Earth
EEPROM	Electrical Erasable Programmable Read Only Memory
ESD	Electrical Static Discharge
ff	Filament (heater voltage) from LOT to the picture tube
FL_A	Filament voltage for CRT
G_TXT_OSD	Green TXT or OSD signal from the uC to IC7225-5C
GND	Ground
GRD_LOT	Ground of LOT
HOR.FLYBACK	Horizontal flyback pulse used for looking the horizontal oscillator
12C	Digital Control bus of the microcomputer
IF	Intermediate frequency signal for sound processing
INT/EXT	Switching signal for Internal or external audio + video switching
L_EXT1	Audio left external 1
LEFT_OUT	Audio left out
MOD_L_1N1	SCART I/P 1 in left
MOD_L_1N2	SCART I/P 2 in left
MOD_R_1N1	SCART I/P 1 in righ
MOD_L_1N2	SCART I/P 2 in left
MONO/STROBE/BG_L	Strobe signal for HEF 4094 on multi-mono sound panel
MONO_OUT	Audio mono out
NTSC	NTSC colour system
PAL/SECAM	PAL or SECAM colour system
R_TXT_OSD	Blue TXT or OSD signal from the uC to the video controller IC7225 5C
RAM	Random Access Memory
RESET1	Reset signal for the uC
RF_AGC	Automatic gain control signal I for tuner
RIGHT_OUT	Audio right ou
ROM	Read Only Memory
SAM	Service Alignment Mode
SANDCASTLE	Sand castle signal from IC7225-5D to delay line IC7255 and SECAM chrominance decoder IC7241.
SCL	Clock line of the 12C-bus
SDA	Data line of the 12C-bus
SDM	Service Default Mode; predefined mode for faultfinding
SECAM_REF	SECAM reference
SID/STA/LL	Sound identification / stereo available / france system "L"
SIF	Sound IF signal for FM demodulator
STANDBY	Switching signal from uC "low" for standby (power supply will be switched to stand-by mode), "high" for normal operation
TREBLE	Treble control signal
V_TUNE	Tuning voltage for tuner
VFB	Vertical flyback pulse
VFL	50Hz vertical flyback pulse used to inform the uC that flyback takes place. This is important for OSD and TXT
VG2	Voltage on grid 2 of the picture tube
VOLUME	Control signal (from uC, but on DC level via RC nework) for volume control of sound processing in sound panel

12 Spareparts list

Mainpanel

Various

0136∆	4822 492 70289	SPRING K12
0139∆	4822 276 13603	SWITCH,MAINS
0140∆	4822 256 92053	FUSE HOLDER CLICK (PROM)
0141∆	4822 265 20723	B2P3-VH
0142∆	4822 265 20723	B2P3-VH
0151	4822 256 10336	LED HOLDER
0177	4822 492 70788	FIX IC
0189	4822 402 10844	PCB RELIEF BRACKET
0191	4822 267 31014	HEADPHONE SOCKET
0191	4822 267 51391	F PHONE 3.5MM STEREO
0210∆	4822 492 70289	SPRING K12
0211∆	4822 492 70289	SPRING K12
0231	4822 265 10453	9P
1000∆	4822 210 10737	UV1355/I
1000∆	4822 210 10771	UV1355S/I
1000∆	4822 210 10803	UV1336B/AIS
1000∆	4822 210 10804	UV1336B/AFS
1000∆	4822 210 10814	UV1336B/A F
1007∆	4822 212 11691	FRAME 29"
1015	4822 242 10357	OFWK2960M
1015	4822 242 10874	45.750 000 MHz
1015	4822 242 81556	B39380-K2953-M100
1015	4822 242 81964	B39389-G1984-M100
1102∆	4822 242 10316	SFSF6,5MHz B-TF21
1104	4822 242 10314	SFSH5,5MHz B-TF21
1104	4822 242 10362	SFSH6,0MHz B-TF21
1104	4822 242 10363	SFSH4,5MHz B-TF21
1206	4822 242 81572	TPS6,0MB-TF21
1207	4822 242 81712	TPWA04B
1207	4822 242 81978	TPS4,5MB-TF21
1208	4822 242 81301	TPS6,5MB-TF21
1209	4822 242 81978	TPS4,5MB-TF21
1275	4822 242 10327	HC49/U 3M575611
1275	4822 242 10356	4,433619MHz HC49/U
1275	4822 242 10695	4 433 619 MHz
1277	4822 242 10355	3,579545MHz HC49/U
1277	4822 242 10776	3.579 545 MHz
1278	4822 242 10326	HC49/U 3M582056
1300	4822 242 10359	CSB503F58
1500	4822 070 35002	218005.(5A)
1572∆	4822 071 51002	19372(1A)
1600	4822 276 13775	SWITCH
1601	4822 276 13775	SWITCH
1602	4822 276 13775	SWITCH
1603	4822 276 13775	SWITCH
1670	4822 218 11573	GP1U28QP
1681	4822 242 10694	12 000 000 MHz

⊣⊢

2002	4822 124 80791	µF 470µF 16V 20% 85C DXH=8X11.5
2050	4822 126 13486	µF 15pF 2% 63V
2128	5322 126 10465	µF 3.9nF 10% 50V
2198	4822 122 33805	µF 330pF 10% 63V
2199	4822 122 33805	µF 330pF 10% 63V
2209	4822 126 13473	µF 220nF 80-20% 50V
2215	4822 126 13061	µF 220nF 20% 25V
2224	4822 124 11576	µF 220µF 20% 25V
2275	4822 126 13486	µF 15pF 2% 63V
2277	4822 126 13486	µF 15pF 2% 63V
2278	4822 126 13486	µF 15pF 2% 63V
2283∆	4822 126 12944	µF 47nF 10% 50V
2284∆	4822 126 12944	µF 47nF 10% 50V
2285∆	4822 126 12944	µF 47nF 10% 50V
2315	4822 126 13482	µF 470nF 80/20% 16V
2316	4822 126 13482	µF 470nF 80/20% 16V
2323∆	4822 121 43823	µF 470nF 5% 50V
2324∆	4822 121 43823	µF 470nF 5% 50V
2325∆	4822 121 43823	µF 470nF 5% 50V
2326∆	4822 121 43823	µF 470nF 5% 50V
2327	4822 126 13482	µF 470nF 80/20% 16V
2328	4822 126 13482	µF 470nF 80/20% 16V
2337	4822 122 32646	µF 5.6nF 10% 50V
2339	4822 126 14043	µF 1µF 20% 16V
2342	4822 124 80061	µF 1000µF 20% 25V
2346	4822 126 14043	µF 1µF 20% 16V
2347	4822 126 14043	µF 1µF 20% 16V
2348	4822 126 14043	µF 1µF 20% 16V
2349	4822 126 13473	µF 220nF 80-20% 50V
2351	4822 126 13482	µF 470nF 80/20% 16V
2353	4822 124 81151	µF 22µF 50V
2354	4822 126 13473	µF 220nF 80-20% 50V
2355	4822 126 14043	µF 1µF 20% 16V
2357	4822 126 13482	µF 470nF 80/20% 16V
2359	4822 126 13482	µF 470nF 80/20% 16V
2369∆	4822 126 12944	µF 47nF 10% 50V
2383	4822 126 14043	µF 1µF 20% 16V
2385	4822 126 14043	µF 1µF 20% 16V
2387	4822 126 13482	µF 470nF 80/20% 16V
2388	4822 122 32646	µF 5.6nF 10% 50V
2401	5322 121 42386	µF 100nF 5% 63V
2402	5322 121 42386	µF 100nF 5% 63V
2403	4822 124 40255	µF 100µF 20% 63V
2404∆	4822 126 12171	µF 3.3nF 20% 1KV
2409	4822 121 42408	µF 220nF 5% 63V
2409	4822 121 42868	µF 220nF 5% 50V
2422	5322 122 32331	µF 1nF 10% 100V
2426	5322 121 42386	µF 100nF 5% 63V
2448∆	4822 122 31173	µF 220pF 10% 500V
2450	4822 124 41739	µF 47µF 20% 160V
2451∆	4822 122 30103	µF 22nF 80% 63V
2451	4822 126 13513	µF 8.2nF 10% 50V
2456	4822 121 43526	µF 47nF 5% 250V
2457∆	4822 121 10518	µF 250V 390nF 5%
2457∆	4822 121 43888	µF 360nF 5% 250V
2458	4822 124 41984	µF 10µF 250V
2459∆	4822 126 13185	µF 680pF 10% 500V
2460	4822 126 12638	µF 6.8nF 10% B 50V
2461	4822 122 31175	µF 1nF 10% 500V
2462	4822 121 43526	µF 47nF 5% 250V
2463∆	4822 126 12239	µF 560pF 10% 2KV
2463∆	4822 126 14053	µF 1nF 10% 2KV
2463∆	4822 126 14184	µF 820pF 10% 2KV
2464	4822 121 10739	µF 2.2µF 5% 160V MPP479
2465∆	4822 121 70637	µF 8.2nF 5% 1600V
2465∆	4822 121 70649	µF 9.1nF 5% 1.6KV
2466	4822 121 40483	µF 10nF 10% 400V
2467∆	4822 121 40488	µF 22nF 10% 400V
2468∆	5322 121 42532	µF 18nF 10% 400V
2468∆	5322 121 44151	µF 33nF 10% 400V
2469	4822 121 51319	µF 1µF 10% 63V
2470	4822 122 31177	µF 470pF 10% 500V
2471	4822 121 51252	µF 470nF 5% 63V
2472	5322 124 41379	µF 2.2µF 20% 50V
2475	4822 126 14096	µF 560nF 5% 250V
2480∆	4822 121 40518	µF 100nF 10% 250V
2481∆	4822 121 43823	µF 470nF 5% 50V
2484	5322 121 42386	µF 100nF 5% 63V
2485	4822 124 11534	µF 4.7µF 20% 250V
2486	4822 124 80791	µF 470µF 16V 20% 85C DXH=8X11.5
2487	4822 124 11769	µF 220µF 20% 50V
2488	4822 124 80791	µF 470µF 16V 20% 85C DXH=8X11.5
2489	4822 124 80062	µF 470µF 20% 35V
2490	4822 122 31177	µF 470pF 10% 500V
2491	4822 122 31177	µF 470pF 10% 500V
2500∆	4822 126 13589	µF 470nF 275V
2501	4822 121 70141	µF 33nF 5% 400V
2502∆	4822 126 12793	µF 2.2nF 10% 2KV
2504∆	4822 126 12793	µF 2.2nF 10% 2KV
2505∆	4822 126 12793	µF 2.2nF 10% 2KV
2507∆	4822 126 11524	µF 1.5nF 10% 1KV
2508	4822 121 10486	µF 330µF 20% 450V
2508∆	4822 124 41748	µF 220µF 20% 400V
2508∆	4822 124 42168	µF 330µF 400V
2510∆	4822 126 11524	µF 1.5nF 10% 1KV
2511∆	4822 126 13337	µF 220pF 10% 1KV
2517	5322 122 32331	µF 1nF 10% 100V
2518∆	4822 122 50116	µF 470pF 10% 1KV
2524	4822 122 33805	µF 330pF 10% 63V
2530	4822 124 11571	µF 1µF 20% 50V
2531	4822 121 10738	µF 1nF 2% 50V
2540	4822 124 80059	µF 100µF 20% 25V
2541	4822 124 81089	µF 2.2µF 20% 160V
2545∆	4822 126 14049	µF 1.5nF 20% 250V
2550∆	4822 126 14149	µF 330pF 10%R 1KV
2551	4822 124 42336	µF 47µF 20% 160V
2554	4822 126 13061	µF 220nF 20% 25V
2560∆	4822 126 14149	µF 330pF 10%R 1KV
2561	4822 124 81145	16V S 1000µF PM20
2562	4822 124 41097	µF 220µF 20% 16V
2563	4822 124 80499	µF 100µF 20% 16V
2571	4822 124 80707	µF 2200µF 20% 25V
2575	4822 126 14087	µF 100nF 10% 63V
2601	4822 126 13061	µF 220nF 20% 25V
2610	4822 126 13473	µF 220nF 80-20% 50V
2615	4822 126 13473	µF 220nF 80-20% 50V
2650	4822 126 13482	µF 470nF 80/20% 16V
2660	5322 126 10184	µF 680P 5% 50V.
2661	5322 126 10184	µF 680P 5% 50V.
2680	4822 126 13061	µF 220nF 20% 25V
2684	4822 126 13061	µF 220nF 20% 25V

−▭−

3171	4822 051 20394	390k 5% 0.1W
3178	4822 051 20394	390k 5% 0.1W
3234∆	4822 052 10228	2Ω2 5% 0.33W
3249	4822 051 20106	10M 5% 0.1W
3277	4822 117 11437	8k2 1% 0.1W
3342	4822 051 20475	4M7 5% 0.1W
3346∆	4822 051 20121	120Ω 5% 0.1W
3360∆	4822 051 20121	120Ω 5% 0.1W
3401	4822 111 31051	3Ω3 5%
3402	4822 111 31051	3Ω3 5%
3403	4822 111 31051	3Ω3 5%
3405∆	4822 050 21802	1k8 1% 0.6W
3405	4822 050 22202	2k2 1% 0.6W
3407∆	4822 050 21802	1k8 1% 0.6W
3407	4822 050 22202	2k2 1% 0.6W
3409∆	4822 052 10158	1Ω5 5% 0.33W
3430∆	4822 052 10478	4Ω7 5% 0.33W
3443	4822 051 20684	680k 5% 0.1W
3451∆	4822 053 11479	47Ω 5% 2W
3453	4822 117 12822	4Ω7 5% 5W
3454	4822 053 11333	33k 5% 2W
3462	4822 117 12514	6k8 5% 5W
3465∆	4822 052 10109	10Ω 5% 0.33W
3480	4822 050 22703	27k 1% 0.6W
3481∆	4822 050 24303	43k 1% 0.6W
3481	4822 050 28203	82k 1% 0.6W
3482∆	4822 050 24303	43k 1% 0.6W
3482	4822 050 25603	56k 1% 0.6W
3485∆	4822 052 10478	4Ω7 5% 0.33W
3486∆	4822 052 11108	1Ω 5% 0.5W
3487∆	4822 052 11108	1Ω 5% 0.5W
3488∆	4822 052 10478	4Ω7 5% 0.33W
3490∆	4822 052 10338	3Ω3 5% 0.33W
3491∆	4822 052 11108	1Ω 5% 0.5W
3492∆	4822 052 11108	1Ω 5% 0.5W
3501	4822 117 12181	470Ω 20% 0.5W
3502∆	4822 053 21225	2M2 5% 0.5W
3504	4822 117 12728	9Ω 200V S 100R
3505	4822 252 60151	SURGE PROTECT DSP-510N-A21F A
3507	4822 116 82776	2Ω2
3509	4822 117 11488	33k 5% 3W
3510	4822 117 11488	33k 5% 3W
3511	4822 117 12568	RESISTOR 7 WATT(MOX)
3513	4822 117 11719	180k
3514	4822 050 28204	820k 1% 0.6W
3515∆	4822 117 12765	4Ω7 20% 3W1
3518∆	4822 116 83027	R22 5% 3W
3525∆	4822 052 10339	33Ω 5% 0.33W
3542∆	4822 053 21475	4M7 5% 0.5W
3552∆	4822 051 20332	3k3 5% 0.1W
3553∆	4822 051 20121	120Ω 5% 0.1W
3554	4822 117 11139	1k5 1% 0.1W
3571	4822 050 21504	150k 1% 0.6W
3571	4822 050 21604	160k 1% 0.6W
3572	4822 101 11186	470Ω 30%LIN 0.1W
3601	4822 116 90885	8k2X6
3602	4822 117 12168	2k2 X 6
3603	4822 117 12167	8k2 X 12
3685	4822 051 20683	68k 5% 0.1W

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5003	4822 157 11518	5.6µH 5% 2.3X3.4
5040	4822 157 70439	FOR MK2 AND ANUB S.
5051	4822 152 20547	IND FXD LAL04 A 0U68 PM20 A
5054	4822 157 11519	1.2µH 5% 2.3X3.4
5101	4822 157 11515	12µH 5% 2.3X3.4
5101	4822 157 11516	15µH 5% 2.3X3.4
5101	4822 157 11526	22µH 5% 2.3X3.4
5205	4822 157 11517	10µH 5% 2.3X3.4
5206	4822 157 11518	5.6µH 5% 2.3X3.4
5206	4822 157 11524	8.2µH 5% 2.3X3.4
5260	4822 157 11326	IF COIL 77.8mH z
5260	4822 157 11514	76mH z
5260	4822 157 11527	IFT COIL 91.5mH z
5260	4822 157 11528	IFT COIL 77.8mH z
5445∆	4822 146 10961	FLYBACK TRANSFORMER
5445∆	4822 146 10963	FLYBACK TRANSFORMER
5445∆	4822 146 10966	FLYBACK TRANSFORMER POWER
5451	4822 157 11521	33µH 10% 8X10
5451	4822 157 71266	27µH
5457	4822 157 11522	LIN. CORRECTOR COIL
5457	4822 157 11546	LINEARITY CORRECTOR COIL
5461∆	4822 142 40351	LINE DRIVE TRAFO -CU15
5463∆	4822 157 71405	BRIDGE COIL -CI15
5465∆	4822 140 10509	BRIDGE COIL U15
5470∆	4822 158 10728	TRANSF. 11µH
5471	4822 157 11547	1000µH 10% 8X10
5480	5322 157 51687	FXDIND A 04 39µH PM10 (UAW)
5500∆	4822 157 11523	LINE 5mH /2A
5502	4822 157 10476	DMF-2820H
5502	4822 157 11538	10mH 2A
5515	4822 157 11477	LAL02TB2R2J
5516	4822 157 60171	HF70BTL3.5X9R
5518	4822 526 10704	100mH z
5520	4822 526 10704	100mH z
5540	4822 157 71249	IND FXD LAL02 A 4U7 PM5 A
5545∆	4822 146 10964	TFM SMT 130V
5545∆	4822 157 11529	SMT LAYER WIRE
5550	4822 157 60171	HF70BTL3.5X9R
5551	4822 157 71401	27µH
5572	4822 157 60171	HF70BTL3.5X9R
5573	4822 157 60171	HF70BTL3.5X9R
5574	4822 157 11327	1U 20%
5574	4822 157 11408	2.2µH 10% 8X10
5603	4822 157 11524	8.2µH 5% 2.3X3.4
5620	4822 157 11525	6.8µH 5% 2.3X3.4

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6040	5322 130 34955	BA482
6112∆	4822 130 83757	BAS216
6114∆	4822 130 83757	BAS216
6263∆	4822 130 83757	BAS216
6264∆	4822 130 83757	BAS216
6265∆	4822 130 83757	BAS216
6401	4822 130 42488	BYD33D
6402∆	4822 130 31024	BZX79-B18
6403	4822 130 42488	BYD33D
6421	4822 130 34258	BZX79-B56
6460∆	4822 130 41275	BY228
6461∆	4822 130 41602	BYW95C
6465	4822 130 42606	BYD33J
6466	4822 130 42606	BYD33J
6470	4822 130 30862	BZX79-B9V1
6480	4822 130 34379	BZX79-B27
6485	4822 130 42488	BYD33D
6486	5322 130 31938	BYV27-200
6487	4822 130 42488	BYD33D
6488	4822 130 42488	BYD33D
6490	5322 130 31938	BYV27-200
6505∆	4822 130 10741	GBU6J
6505	4822 130 11185	GBU4J
6507	4822 130 42606	BYD33J
6508	4822 130 42606	BYD33J
6511	4822 130 41487	BYV95C
6514∆	4822 130 31024	BZX79-B18
6515	4822 130 42606	BYD33J
6517	4822 130 42606	BYD33J
6550	4822 130 10754	BY229X-600
6560	4822 130 10256	EGP20DL-5300
6570	4822 130 10256	EGP20DL-5300
6590	4822 130 10256	EGP20DL-5300
6653	4822 130 34382	BZX79-B8V2
6663∆	4822 130 82029	LTL307P

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7001	5322 130 60508	BC857B
7002	5322 130 60508	BC857B
7003	5322 130 60508	BC857B
7004	5322 130 60508	BC857B
7005	4822 130 60511	BC847B
7101	4822 130 60511	BC847B
7115	4822 130 60511	BC847B
7117	4822 130 60511	BC847B
7118	4822 130 60511	BC847B
7204	4822 130 60511	BC847B
7214	4822 130 60511	BC847B
7215	4822 130 60511	BC847B
7216	5322 130 60508	BC857B
7217	5322 130 60508	BC857B
7220	4822 130 60511	BC847B
7225	4822 209 15685	TDA8844/N1
7225	4822 209 15828	TDA8347C/N3
7225	4822 209 16309	TDA8377/N3
7225	4822 209 16311	TDA8375A/N3
7255	4822 209 12635	TDA4665/V4
7260	5322 130 60508	BC857B
7277∆	4822 130 42353	BSF19-F2
7278∆	4822 130 42353	BSF19-F2
7310	4822 209 33293	TDA9860/V2
7311	4822 209 13646	TDA7057AQ/N2
7312	4822 209 32918	AN7318S
7314	4822 130 60511	BC847B
7315	4822 209 13181	TDA9850/V1
7317∆	4822 130 40981	BC337-25
7401	4822 209 13176	TDA9302H
7401	4822 209 16352	STV9379FA
7420	5322 130 60508	BC857B
7460	4822 130 63569	BU1508DX
7461	4822 130 42159	BF819
7470	4822 130 63726	MTP3055EFI
7480∆	4822 130 40981	BC337-25
7481	4822 130 44568	BC557B
7482	5322 130 60508	BC857B
7518	4822 130 63698	STH8NA60FI

12 Spareparts list

7520	4822 209 15684	MC44603AP
7541	4822 209 15829	TDA8139
7542	5322 130 60508	BC857B
7570	4822 209 81397	TL431CLPST
7581Δ	4822 209 71634	TCDT1101G
7600	4822 209 15831	P87C766BDR/01
7600	4822 209 16308	P87C770AAR/40
7600	4822 209 16312	SAA5297PS/051
7600	4822 209 16459	P83C366BDR/016
7603	4822 130 60511	BC847B
7608	4822 130 60511	BC847B
7610Δ	4822 209 73852	PMBT2369
7620	4822 209 15822	ST24W04B6
7650	4822 130 60511	BC847B
7651	4822 130 60511	BC847B
7681	4822 130 60511	BC847B
7682	4822 130 60511	BC847B

CRT panel

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2830	4822 121 51473	µF 470nF 20% 63V
2840	4822 124 11565	µF 10µF 20% 250V
2841	4822 126 13599	µF 3.3nF 10% 500V
2843Δ	4822 126 12278	µF 3300pF 10%) 2KV
2845	4822 122 31175	µF 1nF 10% 500V

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3832	4822 117 12516	680Ω 2%0.5W
3834	4822 117 12516	680Ω 2%0.5W
3836	4822 117 12516	680Ω 2%0.5W
3840Δ	4822 052 10109	10Ω 5% 0.33W
3841Δ	4822 052 10108	1Ω 5% 0.33W
3842Δ	4822 052 10108	1Ω 5% 0.33W
3843	4822 117 11896	1k5 20% 0.5W
3845	4822 117 13016	1M A/50V MAX 115V

Audio panel

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7830	4822 209 16321	TDA6107Q/N1
1204	4822 242 10769	18.432 000 MHz

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2214	4822 126 13486	µF 15pF 2% 63V
2216	4822 126 13061	µF 220nF 20% 25V
2217	4822 126 13061	µF 220nF 20% 25V
2220	4822 126 13061	µF 220nF 20% 25V
2221	4822 126 13061	µF 220nF 20% 25V
2225	5322 122 32286	µF 3.3pF 5% 50V
2226	5322 122 32286	µF 3.3pF 5% 50V
2239Δ	4822 122 33172	µF 390pF 5% 50V
2240Δ	4822 122 33172	µF 390pF 5% 50V

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3243	4822 117 11437	8k2 1% 0.1W
3244	5322 117 12487	1k RC12G 1% 0.125W
3247Δ	4822 052 10109	10Ω 5% 0.33W

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5206	4822 157 11515	12µH 5% 2.3X3.4

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7202	4822 209 15832	MSP3410D-PP-B4
7202	4822 209 16307	MSP3400C-C8
7209	4822 130 60511	BC847B
7214Δ	4822 130 40981	BC337-25
7215	4822 130 60511	BC847B
7216	4822 130 60511	BC847B